PALM Intranet

Application Number [ ] SEARCH

IDS Flag Clearance for Application 10511957

IDS Information

Content	Mailroom Date	Entry Number	IDS Review	Reviewer
M844	07-19-2005	11	☑	08-26-2005 09:14:57 dmartin

UPDATE

Refine Search

Search Results -

Term	Documents
ANTENNA	363890
ANTENNAS	85613
(22 AND ANTENNA).PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD.	30
(L22 AND ANTENNA).PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD.	30

Database:
US Pre-Grant Publication Full-Text Database
US Patents Full-Text Database
US OCR Full-Text Database
EPO Abstracts Database
JPO Abstracts Database
Derwent World Patents Index
IBM Technical Disclosure Bulletins

Search: L23

Refine Search | Recall Text | Clear | Interrupt

Search History

DATE: Saturday, May 20, 2006 Printable Copy Create Case

Set Name side by side	Query	Hit Count	Set Name result set
DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD; PLUR=YES; OP=ADJ			
L23	L22 and antenna	30	L23
L22	L19 and (rf adj coil)	75	L22
L21	L18 and (balun or half near wavelength) and (transmit$4 or receive$4) near (split$4 or combin$4) and (coaxial near delay)	0	L21
L20	L18 and (balun or half near wavelength) and (transmit$4 or receive$4) and (split$4 or combin$4) and (coaxial near delay)	0	L20
L19	L18 and (balun or half near wavelength) and (transmit$4 or receive$4) or (split$4 or combin$4) and (coaxial near delay)	288	L19

L18	L17 and L14	1342	L18
L17	L16 and L15 and L14 and L13	1342	L17
L16	(324/300-324 or 600/117,407,410,411,422, 423,424 or 330/210,295).ccls.	14358	L16
L15	(balun or half near wavelength) and (transmit$4 or receive$4) or split$4 or combin$4 or (coaxial near delay)	3051923	L15
L14	(decoupl$4 or demodulat$4) and (anrenna or coil)	36221	L14
L13	(magnetic adj resonance) or MRI or nmr	226587	L13
L12	5144244	14	L12
L11	4801885	14	L11
DB=USPT; PLUR=YES; OP=ADJ			
L10	'4920318'.pn.	1	L10
L9	'4920318'.pn.	1	L9
DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD; PLUR=YES; OP=ADJ			
L8	4920318	58	L8
DB=USPT; PLUR=YES; OP=ADJ			
L7	'5964705'.pn.	1	L7
L6	'5964705'.pn.	1	L6
L5	'6263229'.pn.	1	L5
L4	'6263229'.pn.	1	L4
DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD; PLUR=YES; OP=ADJ			
L3	6263229	54	L3
L2	wo000025673.pn.	0	L2
L1	wo000025673	0	L1

END OF SEARCH HISTORY

Hit List

First Hit | Clear | Generate Collection | Print | Fwd Refs | Bkwd Refs | Generate OACS

Search Results - Record(s) 1 through 30 of 30 returned.

☐ 1. Document ID: US 6898454 B2 Relevance Rank: 56

Using default format because multiple data bases are involved.

L23: Entry 12 of 30 File: USPT May 24, 2005

US-PAT-NO: 6898454
DOCUMENT-IDENTIFIER: US 6898454 B2

TITLE: Systems and methods for evaluating the urethra and the periurethral tissues

DATE-ISSUED: May 24, 2005

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Atalar; Ergin	Columbia	MD		
Quick; Harald Hartmann	Essen-Werden			DE
Karmarkar; Parag	Elliot City	MD		

US-CL-CURRENT: 600/410

Full | Title | Citation | Front | Review | Classification | Date | Reference | | | Claims | KWIC | Draw D

☐ 2. Document ID: US 6608480 B1 Relevance Rank: 50

L23: Entry 17 of 30 File: USPT Aug 19, 2003

US-PAT-NO: 6608480
DOCUMENT-IDENTIFIER: US 6608480 B1

TITLE: RF coil for homogeneous quadrature transmit and multiple channel receive

DATE-ISSUED: August 19, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Weyers; Daniel J.	Wauwatosa	WI		

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
GE Medical Systems Global Technology					

Hit List

First Hit | Clear | Generate Collection | Print | Fwd Refs | Bkwd Refs | Generate OACS

Search Results - Record(s) 1 through 14 of 14 returned.

☐ 1. Document ID: US 5144244 A Relevance Rank: 99

Using default format because multiple data bases are involved.

L11: Entry 10 of 14 File: USPT Sep 1, 1992

US-PAT-NO: 5144244
DOCUMENT-IDENTIFIER: US 5144244 A

TITLE: Error-proof decoupling of transmission and reception antennas in a nuclear magnetic resonance apparatus

DATE-ISSUED: September 1, 1992

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Kess; Helmut	Erlangen			DE

US-CL-CURRENT: 324/322; 324/318

Full | Title | Citation | Front | Review | Classification | Date | Reference | | | Claims | KWIC | Draw. D

☐ 2. Document ID: US 5260658 A Relevance Rank: 96

L11: Entry 7 of 14 File: USPT Nov 9, 1993

US-PAT-NO: 5260658
DOCUMENT-IDENTIFIER: US 5260658 A

TITLE: Detuning circuit for resonators in a nuclear magnetic resonance imaging apparatus

DATE-ISSUED: November 9, 1993

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Greim; Helmut	Adelsdorf			DE
Ruhl; Juergen	Erlangen			DE
Oppelt; Ralph	Weiher			DE

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Siemens Aktiengesellschaft	Munich			DE	03

APPL-NO: 07/802542 [PALM]
DATE FILED: December 5, 1991

FOREIGN-APPL-PRIORITY-DATA:

COUNTRY	APPL-NO	APPL-DATE
DE	4039409	December 10, 1990

INT-CL-ISSUED: [05] G01B 33/20

US-CL-ISSUED: 324/322
US-CL-CURRENT: 324/322

FIELD-OF-CLASSIFICATION-SEARCH: 324/300, 324/307, 324/309, 324/318, 324/322, 128/653.5
See application file for complete search history.

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
4801885	January 1989	Meissner et al.	324/318

FOREIGN PATENT DOCUMENTS

FOREIGN-PAT-NO	PUBN-DATE	COUNTRY	CLASS
0317090	May 1989	EP	
0389868	March 1990	EP	
3133432	March 1983	DE	

OTHER PUBLICATIONS

"Human in Vivo Phosphate Metabolite Imaging with .sup.31 P NMR" Bottomley et al., Magnetic Resonance in Medicine 7 (1988) pp. 319-336.
"Taschenbuch der Hochfrequenztechnik," Meinke et al. (1956) pp. 185-187.
Patent Abstracts of Japan, P-453 vol. 10, No. 119, May 6, 1986, Application No. 59-103380.

ART-UNIT: 267

PRIMARY-EXAMINER: Tokar; Michael J.

ATTY-AGENT-FIRM: Hill, Steadman & Simpson

ABSTRACT:

A circuit for detuning a resonator in a nuclear magnetic resonance imaging apparatus has an output connected to a terminal of the resonator via a high-

frequency line composed of two conductors. The resonator is shortened at this terminal with a shorting capacitor that can be short-circuited for detuning the resonator. The length of the high-frequency line is shorter than one-fourth of the wavelength of a high-frequency signal having the operating frequency of the nuclear magnetic resonance imaging apparatus on the high-frequency line. For detuning the resonator the high-frequency line can be terminated at the output with a further capacitor, so that the high-frequency line acts as a short-circuit at the terminal.

8 Claims, 2 Drawing figures

☐ 3. Document ID: US 5294886 A Relevance Rank: 96

L11: Entry 6 of 14 File: USPT Mar 15, 1994

US-PAT-NO: 5294886
DOCUMENT-IDENTIFIER: US 5294886 A

TITLE: Antenna system for a magnetic resonance imaging tomography apparatus

DATE-ISSUED: March 15, 1994

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Duerr; Wilhelm	Erlangen			DE

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Siemens Aktiengesellschaft	Munich			DE	03

APPL-NO: 07/872100 [PALM]
DATE FILED: April 22, 1992

FOREIGN-APPL-PRIORITY-DATA:

COUNTRY	APPL-NO	APPL-DATE
DE	4113120	April 22, 1991

INT-CL-ISSUED: [05] G01R 33/00

US-CL-ISSUED: 324/318; 324/322
US-CL-CURRENT: 324/318; 324/322

FIELD-OF-CLASSIFICATION-SEARCH: 333/24R, 333/181, 343/743, 324/300, 324/307, 324/309, 324/310, 324/311, 324/312, 324/313, 324/314, 324/318, 324/322
See application file for complete search history.

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
4680550	July 1987	Krause	324/318
4801885	January 1989	Meissner et al.	324/318
4922204	May 1990	Duerr et al.	324/322
4945321	July 1990	Oppelt et al.	333/119
5200703	April 1993	Popp et al.	324/322

ART-UNIT: 267

PRIMARY-EXAMINER: Tokar; Michael J.

ATTY-AGENT-FIRM: Hill, Steadman & Simpson

ABSTRACT:

In a magnetic resonance imaging tomography apparatus having a transmission antenna for exciting nuclear spins in an examination subject, and a reception antenna in the form of a local coil, the feeder for the local coil is provided with decoupling elements. The decoupling elements prevent a coupling of the electrical field of the transmission antenna with the feeder for the local coil.

9 Claims, 5 Drawing figures

☐ 4. Document ID: US 6084410 A Relevance Rank: 96

L11: Entry 3 of 14 File: USPT Jul 4, 2000

US-PAT-NO: 6084410
DOCUMENT-IDENTIFIER: US 6084410 A

TITLE: Tunable radio-frequency unit for a magnetic resonance device

DATE-ISSUED: July 4, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Nistler; Juergen	Erlangen			DE

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Siemens Aktiengesellschaft	Munich			DE	03

APPL-NO: 09/098425 [PALM]
DATE FILED: June 17, 1998

FOREIGN-APPL-PRIORITY-DATA:

COUNTRY	APPL-NO	APPL-DATE
DE	298 04 339 U	March 11, 1998

INT-CL-ISSUED: [07] G01V 3/00

US-CL-ISSUED: 324/318; 324/322
US-CL-CURRENT: 324/318; 324/322

FIELD-OF-CLASSIFICATION-SEARCH: 324/318, 324/322, 324/311, 324/307, 324/316
See application file for complete search history.

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
4739271	April 1988	Haase	324/322
4801885	January 1989	Meissner et al.	324/318
4901022	February 1990	Keren et al.	324/322
4910461	March 1990	Van Vaals	324/318

ART-UNIT: 282

PRIMARY-EXAMINER: Oda; Christine

ASSISTANT-EXAMINER: Shrivastav; Brij B.

ATTY-AGENT-FIRM: Hill & Simpson

ABSTRACT:

A tunable radio-frequency unit for a magnetic resonance device has a radio-frequency antenna and a radio-frequency signal line connected to a signal terminal of the radio-frequency antenna. The length of the radio-frequency signal line corresponds to a whole-number multiple of a half-wavelength of a radio-frequency signal on the radio-frequency signal line, for a given operating frequency of the radio-frequency antenna. For switching a short circuit on and off, a switching arrangement is connected at an end of the signal line lying opposite the signal terminal.

7 Claims, 2 Drawing figures

☐ 5. Document ID: EP 262495 A, US 4801885 A, EP 262495 B, DE 3771630 G
Relevance Rank: 93

L11: Entry 14 of 14 File: DWPI Apr 6, 1988

DERWENT-ACC-NO: 1988-093041
DERWENT-WEEK: 199618

TITLE: Nuclear spin resonance device for measuring spectra or images - examines objects using quarter wavelength and coaxial lines for decoupling antenna and coil, and causes antenna to emit HF pulses

INVENTOR: KESS, H; MEISSNER, R

PATENT-ASSIGNEE: SIEMENS AG (SIEI)

PRIORITY-DATA: 1986DE-3632137 (September 22, 1986)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
EP 262495 A	April 6, 1988	G	009	
US 4801885 A	January 31, 1989		007	
EP 262495 B	July 24, 1991		000	
DE 3771630 G	August 29, 1991		000	

DESIGNATED-STATES: DE GB NL DE GB NL

CITED-DOCUMENTS:2.Jnl.Ref; DE 3427666 ; EP 164164 ; EP 170514 ; GB 2153086 ; GB 2161940 ; 1.Jnl.Ref ; JP 59070950

APPLICATION-DATA:

PUB-NO	APPL-DATE	APPL-NO	DESCRIPTOR
EP 262495A	September 11, 1987	1987EP-0113338	
US 4801885A	September 16, 1987	1987US-0097738	

INT-CL (IPC): G01N 24/04; G01R 33/20

ABSTRACTED-PUB-NO: EP 262495A
BASIC-ABSTRACT:

Coils apply base and gradient fields to the object under investigation. A whole body antenna (9) irradiates the object with a sequence of high frequency pulses. The nuclear resonance signals emitted by the body are detected by a surface coil. The antenna and surface coil are mutually decoupled. A quarter-wavelength line (20) is connected to the antenna (9) via a coaxial cable (22,23).

The end of the line is short-circuited when HF pulses are emitted by the antenna and is open when nuclear resonance signals are received by the surface coil. The coaxial line transforms the high impedance of the whole body antenna to a low level.

USE/ADVANTAGE - For investigating individual regions of body. Influence of resonant circuit on decoupling arrangement remains low esp. outside detuning phase, and no current flows in surface coil at this time.

ABSTRACTED-PUB-NO: EP 262495B
EQUIVALENT-ABSTRACTS:

A nuclear spin resonance apparatus for detecting spectra or images of an object under examination by means of nuclear magnetic resonance with coils (1,2,3,4,7,8) for applying magnetic base and gradient fields to the object under examination (5), with a whole-body antenna (9), with which the object under examination (5) is irradiated with a series of high frequency pulses with the wave length lambda and with a surface coil (19), which detects nuclear resonance signals emitted by the object under examination (5), wherein the whole-body antenna (9) and the surface coil (19) are decoupled from each other, characterised in that connected to the whole body antenna (9) by way of a coaxial line (22, 23) there is A/4 line (20), the end of which is short-circuited, when emitting HF pulses, with the whole-body antenna (9), and when receiving the nuclear resonance signals, is opened with the surface coil (19), wherein the coaxial line (22, 23) transforms the high impedance of the whole-body antenna (9) to a low level.

(7pp)

US 4801885A

The nuclear magnetic resonance apparatus includes a whole-body antenna, for transmitting radio frequency signals at a wavelength to induce nuclear magnetic resonance phenomena in the examination subject and a surface coil for receiving the resulting nuclear magnetic resonance signals. For decoupling the body resonator from the surface coil, a quarter wavelength line is connected to the surface coil. A terminating end of the line is short-circuited during emission of radio frequency pulses by the body resonator and is opened during reception of nuclear magnetic resonance signals using the surface coil. ADVANTAGE - Gives complete decoupling.

(7pp)

CHOSEN-DRAWING: Dwg.2/5

DERWENT-CLASS: S03 S05
EPI-CODES: S03-E07; S05-D02X;

☐ 6. Document ID: US 4801885 A Relevance Rank: 93

L11: Entry 13 of 14 File: USPT Jan 31, 1989

US-PAT-NO: 4801885
DOCUMENT-IDENTIFIER: US 4801885 A

TITLE: Nuclear magnetic resonance apparatus for the identification of spectra or images of an examination subject

DATE-ISSUED: January 31, 1989

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Meissner; Ralph	Erlangen			DE
Kess; Helmut	Deggendorf			DE

ASSIGNEE-INFORMATION:

NAME	CITY	STATE ZIP CODE	COUNTRY	TYPE CODE
Siemens Aktiengesellshaft	Berlin and Munich		DE	03

APPL-NO: 07/097138 [PALM]
DATE FILED: September 16, 1987

FOREIGN-APPL-PRIORITY-DATA:

COUNTRY	APPL-NO	APPL-DATE
DE	3632137	September 22, 1986

INT-CL-ISSUED: [04] G01R 33/20

US-CL-ISSUED: 324/318; 324/322
US-CL-CURRENT: 324/318; 324/322

FIELD-OF-CLASSIFICATION-SEARCH: 324/318, 324/322, 324/311, 324/313, 324/314
See application file for complete search history.

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
4728896	March 1988	Bendall et al.	324/318

FOREIGN PATENT DOCUMENTS

FOREIGN-PAT-NO	PUBN-DATE	COUNTRY	CLASS
0164164	December 1985	EP	
0170514	February 1986	EP	
3427666	February 1986	DE	
59-70950	April 1984	JP	
2153086	August 1985	GB	
2161940	January 1986	GB	

OTHER PUBLICATIONS

"Improved Surface Coil Imaging in MR: Decoupling of the Excitation and Receiver Coils.sup.1, " Boskamp, Radiology, Nov. 1985, pp. 449-452.

ART-UNIT: 265

PRIMARY-EXAMINER: Levy; Stewart J.

ASSISTANT-EXAMINER: Arana; Louis M.

ABSTRACT:

A nuclear magnetic resonance apparatus which is capable of identifying either

spectra or images of an examination subject uses a body resonator, such as a whole-body antenna, for transmitting radio frequency signals at a wave length .lambda. to induce nuclear magnetic resonance phenomena in the examination subject, and a surface coil for receiving the resulting nuclear magnetic resonance signals. For decoupling the body resonator from the surface coil, a .lambda./4 line is connected to the surface coil. A terminating end of the .lambda./4 line is short-circuited during emission of radio frequency pulses by the body resonator, and is opened during reception of nuclear magnetic resonance signals using the surface coil. An effective detuning of the body resonator is thus achieved during the reception event, and at the same time the transmission event is minimally influenced.

12 Claims, 5 Drawing figures

☐ 7. Document ID: US 5038105 A Relevance Rank: 93

L11: Entry 12 of 14 File: USPT Aug 6, 1991

US-PAT-NO: 5038105
DOCUMENT-IDENTIFIER: US 5038105 A

TITLE: Series/parallel double-tuned NMR coils

DATE-ISSUED: August 6, 1991

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Codrington; Robert S.	Los Altos Hills	CA		
Rath; Alan R.	Fremont	CA		

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Spectroscopy Imaging Systems Corporation	Fremont	CA			02

APPL-NO: 07/477687 [PALM]
DATE FILED: February 9, 1990

INT-CL-ISSUED: [05] G01R 33/20

US-CL-ISSUED: 324/318
US-CL-CURRENT: 324/318

FIELD-OF-CLASSIFICATION-SEARCH: 324/318, 324/322, 307/520, 307/522, 328/137, 328/138, 455/325, 455/327, 333/126, 333/129, 333/132, 333/134
See application file for complete search history.

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
4792759	December 1988	Keren et al.	324/322
4801885	January 1989	Meissner et al.	324/322
4812764	March 1989	Bendall	324/322
4885541	December 1989	Hayes	324/322
4916418	April 1990	Rath	324/318
4928064	May 1990	Keren	324/322

ART-UNIT: 265

PRIMARY-EXAMINER: Tokar; Michael J.

ATTY-AGENT-FIRM: Cole; Stanley Z. Fisher; Gerald M. Berkowitz; Edward H.

ABSTRACT:

A double-tuned circuit is realized from 1/2.lambda..sub.1 transmission lines for connecting a pair of inductors in series at a first frequency and in parallel for a second frequency where said first and second frequencies are in the ratio of a power of two.

6 Claims, 6 Drawing figures

☐ 8. Document ID: US 5107217 A Relevance Rank: 93

L11: Entry 11 of 14 File: USPT Apr 21, 1992

US-PAT-NO: 5107217
DOCUMENT-IDENTIFIER: US 5107217 A

TITLE: Radio frequency antenna for a nuclear magnetic resonance tomography apparatus

DATE-ISSUED: April 21, 1992

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Duerr; Wilhelm	Erlangen			DE

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Siemens Aktiengesellschaft	Munich			DE	03

APPL-NO: 07/499771 [PALM]
DATE FILED: March 27, 1990

FOREIGN-APPL-PRIORITY-DATA:

COUNTRY	APPL-NO	APPL-DATE
DE	3910187	March 29, 1989

INT-CL-ISSUED: [05] G01R 33/20

US-CL-ISSUED: 324/322; 333/219
US-CL-CURRENT: 324/322; 333/219

FIELD-OF-CLASSIFICATION-SEARCH: 324/300, 324/307, 324/309, 324/314, 324/318, 324/322, 333/219
See application file for complete search history.

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
4435680	March 1984	Froncisz et al.	
4446429	May 1984	Froncisz et al.	
4506224	March 1985	Krause	
4620155	October 1986	Edelstein	324/318
4742304	May 1988	Schnall et al.	
4755756	July 1988	Nishihara et al.	324/322
4792759	December 1988	Keren et al.	324/322
4801885	January 1989	Meissner et al.	
4881034	November 1989	Kaufman et al.	324/318

FOREIGN PATENT DOCUMENTS

FOREIGN-PAT-NO	PUBN-DATE	COUNTRY	CLASS
0094734	November 1983	EP	
0257782	March 1988	EP	
0301232	February 1989	EP	

OTHER PUBLICATIONS

"The Design and Use of Dual-Frequency Surface Coil Providing Proton Images for Improved Localization in 31P Spectroscopy of Small Leisons", Leach et al., Medical Physics, vol. 13, No. 4, Jul./Aug. 1986, pp. 510-513.

ART-UNIT: 265

PRIMARY-EXAMINER: Tokar; Michael J.

ATTY-AGENT-FIRM: Hill, Van Santen, Steadman & Simpson

ABSTRACT:

A radio frequency antenna for a nuclear magnetic resonance tomography apparatus has

interior conductors which form a transmission line resonator with at least one shortening capacitor. The transmission line resonator can resonate at a plurality of resonator frequencies, and a trap circuit is provided for decoupling the interior conductors from the other conductors. The antenna can be operated at a number of different resonate frequencies, for example, at frequency f.sub.1 =170 MHz for protons (hydrogen) and F.sub.2 =69 MHz for phosphorous.

13 Claims, 10 Drawing figures

☐ 9. Document ID: US 5229724 A Relevance Rank: 93

L11: Entry 9 of 14 File: USPT Jul 20, 1993

US-PAT-NO: 5229724
DOCUMENT-IDENTIFIER: US 5229724 A

TITLE: Sample head for nuclear resonance measurements

DATE-ISSUED: July 20, 1993

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Zeiger; Heinz	Waldbronn			DE

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Bruker Analytische Messtechnik GmbH				DE	03

APPL-NO: 07/642626 [PALM]
DATE FILED: January 17, 1991

FOREIGN-APPL-PRIORITY-DATA:

COUNTRY	APPL-NO	APPL-DATE
DE	4002160	January 25, 1990

INT-CL-ISSUED: [05] G01V 3/00

US-CL-ISSUED: 324/322; 324/318
US-CL-CURRENT: 324/322; 324/318

FIELD-OF-CLASSIFICATION-SEARCH: 324/300, 324/307, 324/309, 324/314, 324/318, 324/322, 128/653.5
See application file for complete search history.

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
4446431	May 1984	McKay	324/318
4728896	March 1988	Bendall et al.	324/318
4801885	January 1989	Meissner et al.	324/318
4952879	August 1990	Van Vaals et al.	324/322
4996482	February 1991	Fujito	324/318
5038105	August 1991	Codrington et al.	324/318

FOREIGN PATENT DOCUMENTS

FOREIGN-PAT-NO	PUBN-DATE	COUNTRY	CLASS
3634030	October 1986	DE	

OTHER PUBLICATIONS

Review of Scientific Instruments, vol. 47, No. 12, Dec. 1976, pp. 1486 to 1488, "Single coil probe with transmission-line tuning for nuclear magnetic double resonance"-Author V. R. Cross, R. K. Hester, and J. S. Waugh.
Journal of Magnetic Resonance 43 (1981), pp. 339 to 416 "A Multinuclear Double-Tuned Probe for Applications with Solids or Liquids Utilizing Lumped Tuning Elements" Authors: F. David Doty, Ruth R. Inners, and Paul D. Ellis.
Review of Scientific Instruments, vol. 51 (7), Jul. 1980, pp. 887 to 890 "A single-coil triple resonance probe for NMR experiments" Authors: S. Kan, M. Fan, and J. Courtieu.

ART-UNIT: 263

PRIMARY-EXAMINER: Arana; Louis

ATTY-AGENT-FIRM: Rosenblum, Parish & Isaacs

ABSTRACT:

A sample head for performing nuclear magnetic resonance measurements on a first kind of nuclei (.sup.1 H) and, further, on a second (.sup.15 N) or a third (.sup.31 P) kind of nuclei within a magnetic field (B) is disclosed. A measuring coil coacts with a sample under analysis and generates a nuclear magnetic resonance within the sample or receives a nuclear magnetic resonance signal from the sample. Terminals are provided for transmitting to or receiving from the measuring coil high-frequency signals having frequencies corresponding to the particular nuclear magnetic resonance frequency of the specific kinds of nuclei (.sup.1 H, .sup.15 N, .sup.31 P), respectively. A high-frequency line is connected to the measuring coil at one end thereof. The line has an electric length which is an integer multiple of a quarter wavelength corresponding to the first, higher frequency. Switching means are associated to the line for switching its electrical length according to two distinct modes of operations where the second and the third, lower frequencies have different values below the first, higher frequency. By actuating the switching means, the line acts as an inductance or as a capacitance, respectively, connected in series with the measuring coil.

18 Claims, 10 Drawing figures

☐ 10. Document ID: US 5258718 A Relevance Rank: 93

L11: Entry 8 of 14 File: USPT Nov 2, 1993

US-PAT-NO: 5258718
DOCUMENT-IDENTIFIER: US 5258718 A

TITLE: Nuclear magnetic resonance tomography apparatus

DATE-ISSUED: November 2, 1993

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Duerr; Wilhelm	Erlangen			DE

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Siemens Aktiengesellschaft	Munich			DE	03

APPL-NO: 07/790506 [PALM]
DATE FILED: November 12, 1991

FOREIGN-APPL-PRIORITY-DATA:

COUNTRY	APPL-NO	APPL-DATE
DE	4038648	December 4, 1990

INT-CL-ISSUED: [05] G01R 33/20

US-CL-ISSUED: 324/322
US-CL-CURRENT: 324/322

FIELD-OF-CLASSIFICATION-SEARCH: 324/300, 324/307, 324/309, 324/318, 324/319, 324/322, 128/653.5
See application file for complete search history.

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
4620155	October 1986	Edelstein	324/322
4763076	August 1988	Arakawa et al.	324/322
4764726	August 1988	Misic et al.	324/322
4801885	January 1989	Meissner et al.	324/318
4890602	December 1989	Haragashira	324/318

FOREIGN PATENT DOCUMENTS

FOREIGN-PAT-NO	PUBN-DATE	COUNTRY	CLASS
0276508	August 1988	EP	
0315382	May 1989	EP	
0317090	May 1989	EP	
3003302	December 1982	DE	
3728863	March 1989	DE	
4003138	August 1990	DE	
9012639	December 1990	DE	

OTHER PUBLICATIONS

Patents Abstract of Japan, P-314, Nov. 17, 1984, vol. 8/No. 252, Japanese Application No. 57-233506.
Siemens Brochure "Surge Arresters" 1985/1986.
"A Versatile Secondary Transmitter Unit for Nuclear Magnetic Resonance Spectroscopy." Retournard et al. Rev. Sci. Instrum., 6(1), Jan., 1990, pp. 69-76.

ART-UNIT: 267

PRIMARY-EXAMINER: Tokar; Michael J.

ATTY-AGENT-FIRM: Hill, Steadman & Simpson

ABSTRACT:

In a nuclear magnetic resonance tomography apparatus, having a high-frequency excitation and measuring coil connected with a capacitor to form a resonant circuit, the capacitor being tuned to a desired operating frequency, a circuit is provided for limiting the voltage of the resonant capacitor in a transmission mode. Avoidance of impermissible peak amplitudes is thereby achieved without the necessity of over-dimensioning the components of the resonant circuit.

15 Claims, 7 Drawing figures

☐ 11. Document ID: US 5621323 A Relevance Rank: 93

L11: Entry 5 of 14 File: USPT Apr 15, 1997

US-PAT-NO: 5621323
DOCUMENT-IDENTIFIER: US 5621323 A

TITLE: Surface coil elements

DATE-ISSUED: April 15, 1997

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY

Larsen; Sanford Provo UT

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Magnetic Research, Inc.	Mapleton	UT			02

APPL-NO: 08/489792 [PALM]
DATE FILED: June 13, 1995

PARENT-CASE:
This application is a continuation of application Ser. No. 07/800,496, filed Nov. 29, 1991, now abandoned.

INT-CL-ISSUED: [06] G01R 33/20

US-CL-ISSUED: 324/318; 324/322
US-CL-CURRENT: 324/318; 324/322

FIELD-OF-CLASSIFICATION-SEARCH: 324/318, 324/322, 324/300, 128/653.2, 128/653.5
See application file for complete search history.

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
4126823	November 1978	Dalton, Jr.	324/301
4408162	October 1983	Egger	324/318
4564812	January 1986	Van Dijk	324/318
4620155	October 1986	Edelstein	324/318
4684895	August 1987	Misic	324/322
4717881	January 1988	Flugan	324/318
4728896	March 1988	Bendall et al.	324/318
4739271	April 1988	Haase	324/322
4782298	November 1988	Arakawa et al.	324/318
4788503	November 1988	Va Heelsbergen	324/322
4801885	January 1989	Meissner	324/318
4839594	June 1989	Misic et al.	324/318
4855680	August 1989	Arakawa et al.	324/322
4866387	September 1989	Hyde	324/318
4974113	November 1990	Gabrielge et al.	324/320
5136244	August 1992	Jones et al.	324/318
5144240	September 1992	Mehdizadeh et al.	324/322
5166618	November 1992	Jones et al.	324/318
5256971	October 1993	Boskamp	324/318
5256972	October 1993	Keren et al.	324/318
5278505	January 1994	Arakawa	324/322

ART-UNIT: 225

PRIMARY-EXAMINER: Snow; Walter E.

ASSISTANT-EXAMINER: Mah; Raymond Y.

ATTY-AGENT-FIRM: Drucker; I. Morley Sommers; Howard N. Kimbell; Daniel R.

ABSTRACT:

A coil element, comprising a quadrature surface coil, includes side by side loops, slightly overlapped to the degree necessary to cancel mutual inductance. A coil includes a split-capacitor configuration for balanced-to-unbalanced conversion between the coil and a coaxial cable, without interfering with the highly magnetic environment of a magnetic resonance imaging system. A coil includes multiple diodes and current stabilizing impedances in parallel, or alternatively a combination of a fast low-power PIN diode and a slow high-power diode to effectively multiply the power handling capability of fast diodes for passive decoupling in a decoupling circuit for reducing the risk to the patient over active decoupling. A coil includes a counter-rotating decoupling circuit to cancel the effects of decoupler radiation, and to prevent lowering of the quality factor of the decoupling circuit and the detection of undesirable image artifacts. A coil includes a capacitor and decoupling circuit opposite that of the primary tuning and decoupling circuit for increased symmetry during the imaging cycle receive and transmit phases.

19 Claims, 6 Drawing figures

☐ 12. Document ID: US 5675254 A Relevance Rank: 93

L11: Entry 4 of 14 File: USPT Oct 7, 1997

US-PAT-NO: 5675254
DOCUMENT-IDENTIFIER: US 5675254 A

TITLE: Double-resonance MRI coil

DATE-ISSUED: October 7, 1997

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Fiat; Daniel	Oak Park	IL		
Dolinsek; Janez	Ljubljana			SI

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
The Board of Trustees of the University of Illinois	Urbana	IL			02

APPL-NO: 08/623667 [PALM]
DATE FILED: March 28, 1996

PARENT-CASE:
This is a Continuation of U.S. application Ser. No. 08/501,888, filed Jul. 13, 1995, now abandoned which is a Continuation of U.S. application Ser. No. 08/105,419, filed Aug. 12, 1993, now abandoned and which is a continuation-in-part of U.S. Ser. No. 08/071,582, entitled "Oxygen-17 NMR Spectroscopy and Imaging in the Human," filed Jun. 2, 1993, now U.S. Pat. No. 5,433,196.

INT-CL-ISSUED: [06] G01R 33/34

US-CL-ISSUED: 324/318
US-CL-CURRENT: 324/318

FIELD-OF-CLASSIFICATION-SEARCH: 324/300, 324/318, 324/322, 335/279
See application file for complete search history.

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
4446431	May 1984	McKay	324/318
4677382	June 1987	Vatis	324/307
4689563	August 1987	Bottomley et al.	324/309
4691163	September 1987	Blass et al.	324/318
4742304	May 1988	Schnall et al.	324/318
4792759	December 1988	Keren et al.	324/318
4801885	January 1989	Meissner et al.	324/318
4890063	December 1989	Haragashira	324/322
4916418	April 1990	Rath	324/318
4928064	May 1990	Keren	324/318
4952879	August 1990	Van Vaals et al.	324/318
5038105	August 1991	Codrington	324/318
5057778	October 1991	Rath	324/318
5162739	November 1992	Doty	324/322
5210494	May 1993	Brunner et al.	324/318
5229724	July 1993	Zeiger	324/318
5245285	September 1993	Ishizuka et al.	324/318

FOREIGN PATENT DOCUMENTS

FOREIGN-PAT-NO	PUBN-DATE	COUNTRY	CLASS
3634030	April 1988	DE	

OTHER PUBLICATIONS

Cross et al., Single coil probe with transmission-line tuning for nuclear double resonance, 47(12) 1486 (Dec., 1976).
Doty et al., A Multinuclear Double Tuned Probe for Applications with Solids or Liquids Utilizing Lumped Tuning Elements, 43 Journal of Magnetic Resonance 399 (1988).

Fiat et al., Determination of the Rate of Cerebral Oxygen Consumption and regional Blood Flow by .sup.17 O In Vivo NMR Spectroscopy and Magnetic Resonance Imaging, 14 Neurological Research 303 (Sep., 1992).
Fiat et al., Determination of the Rate of Cerebral Oxygen Consumption and Regional Cerebral Blood Flow by Non-Invasive .sup.17 O In Vivo NMR Spectroscopy and Magnetic Resonance Imaging, 15 Neurological Research 7 (Feb. 1993).
Fiat et al., Monitoring Cerebral Oxygen Consumption with In Vivo Imaging .sup.17 O NMR, Presented at the XVth International Symposium on Cerebral Flow and Metabolism, Jun. 1-6, 1996, Miami, Florida.
Fiat et al., In Vivo .sup.17 O NMR Study of Rat Brain during O.sub.2 Inhalation, 24 Magnetic Resonance in Medicine 370 (Apr., 1992).
Fiat et al., .sup.17 O NMR and MRI Determination of Cerebral Metabolism of Oxygen (rCMRO.sub.2) and Cerebral Blood Flow (rCBF).sup.1 in the Man, (1993).
Kan et al., A single coil triple resonance probe for NMR experiments, 51(7) Rev. Sci. Instr. 887 (Jul., 1980).
McFarland et al., Chemical Exchange Magnetic Resonance Imaging (Chemi), 6 Magnetic Resonance Imaging 507 (1988).
Mateescu et al., Water, Ions and 0-17 Magnetic Resonance Imaging, Water and Ions in Biological Systems 239 (1988).
Mateescu et al., Oxygen-17 FIRS: In Vivo Evaluation of Water Uptake and Residence Time in the Mouse Brain after Injection of 0-17 Labelled Water, p. 1236 (1990).
Mateescu et al., Oxygen-17 MRI and MRS of the Brain, the Heart and Coronary Arteries, (1989).
Mateescu et al., Oxygen-17: A physiological, biochemical, and Anatomical Mri Contrast Agent, Society of Magnetic Resonance in Medicine 600 (1988).
Mateescu et al., Oxygen-17 Magnetic Resonance: In Vivo Detection of Nascent Mitochondrial Water in Animals Breathing .sup.17 O.sub.2 Enriched Air, Society of Magnetic Resonance in Medicine (1991).
Mateescu et al., Combined .sup.17 O/.sup.1 H Magnetic Resonance Microscopy in Plants, Animals and Materials: Present Status and Potential, Synthesis and Applications of Isotopically Labelled Compounds 499 (1988).
Pekar et al., In Vivo Measurement of Cerebral Oxygen Consumption and Blood Flow Using .sup.17 O Magnetic Resonance Imaging, 21 Magnetic Resonance in Medicine 313 (1991).
Schnall et al., A New Double-Tuned Probe for Concurrent .sup.1 H and .sup.P NMR, 65 Journal of Magnetic Resonance 122 (1985).
Doty et al, "A Multinuclear Double Tuned Probe for Applications with Solids of Liquids Utilizing Lump Tuning Elements," J. of Mag. Res 43,399-416 (1981).
Kan et al, "A Single Coil Triple Resonance Probe for NMR Experiments" Rev Sci Instrm. 51(7) pp. 887-890 (Jul. 1980).
Cross et al, "Single Coil Probe with Transmission-line Tuning for Nuclear Double Resonance." vol. 47 No. 12 pp. 1486-1488 (Dec. 1976).
Fiat, et al., "Determination of the Rate of Cerebral Oxygen Consumption and Regional Cerebral Blood Flow by Non-Invasive .sup.17 O In Vivo NMR Spectroscopy and Magnetic Resonance Imaging," Neurological Research, vol. 14, pp 303-311 (Sep. 1992).
Fiat, et al., "Determination of the Rate of Cerebral Oxygen Consumption and Regional Cerebral Blood Flow by Non-Invasive .sup.17 O In Vivo NMR Spectroscopy and Magnetic Resonance Imaging," Neurological Research, vol. 15, pp. 7-22 (Feb. 1993).
Fiat, et al., "Monitoring Cerebral Oxygen Consumption with In Vivo Imaging .sup.17 O NMR," Presented at the XVth International Symposium on Cerebral Flow and Metabolism, Jun. 1-6, 1991, Miami, Florida.
Fiat, et al. "In Vivo .sup.17 O NMR Study of Rat Brain during .sup.17 O.sub.2 Inhalation," Magnetic Resonance in Medicine 24, pp 370-374, (Apr. 1992).
Fiat, et al., ".sup.17 O NMR and MRI Determination of Cerebral Metabolism of Oxygen (rCMRO.sub.2) and Cerebral Blood Flow (rCBF).sup.1 in the Man" (1993).
McFarland, et al., "Chemical Exchange Magnetic Resonance Imaging (Chemi)," Magnetic Resonance Imaging, vol. 6, pp 507-515 (1988).
Mateescu, et al., "Water, Ions and O-17 Magnetic Resonance Imaging," Water and Ions in Biological Systems, pp 239-250 (1988).

Mateescu, et al., "Oxygen-17 MRS: In Vivo Evaluation of Water Uptake and Residence Time in the Mouse Brain after Injection of O-17 Labelled Water," p. 1236 (1990).
Mateescu, et al., "Oxygen-17 MRI and MRS of the Brain, the Heart and Coronary Arteries," (1989).
Mateescu, et al., "Oxygen-17: A Physiological, Biochemical and Anatomical MRI Contrast Agent," Society of Magnetic Resonance in Medicine, p. 600 (1988).
Mateescu, et al., "Oxygen-17 Magnetic Resonance: In Vivo Detection of Nascent Mitochondrial Water in Animals Breathing .sup.17 O.sub.2 Enriched Air," Society of Magnetic Resonance in Medicine (1991).
Mateescu, et al., "Combined .sup.17 O/.sup.1 H Magnetic Resonance Microscopy in Plants, Animals and Materials: Present Status and Potential," Synthesis and Applications of Isotopically Labelled Compounds, pp 499-508 (1988).
Pekar, et al., "In Vivo Measurement of Cerebral Oxygen Consumption and Blood Flow Using .sup.17 O Magnetic Resonance Imaging," Magnetic Resonance in Medicine 21, pp. 313-319 (1991).
Schnall, et al., "A New Double-Tuned Probe for Concurrent .sup.1 H and .sup.31 P NMR," Journal of Magnetic Resonance 65, pp 122-129 (1985).

ART-UNIT: 225

PRIMARY-EXAMINER: O'Shea; Sandra L.

ASSISTANT-EXAMINER: Phillips; Roger

ATTY-AGENT-FIRM: Welsh & Katz, Ltd.

ABSTRACT:

A double-resonance coil for use in MRI having a coil element, a first input/output terminal coupled to the coil element, and a second input/output terminal coupled to the coil element. A first resonance means is coupled between the coil element and the first input/output terminal to cause the MRI coil to resonate at a first MRI frequency, and a second resonance means is coupled between the coil element and the second input/output terminal to cause the MRI coil to resonate at a second MRI frequency substantially different than the first MRI frequency. The double resonance coil includes a first frequency-blocking means coupled to the coil element for substantially preventing the second MRI frequency from being detected at the first input/output terminal and a second frequency-blocking means coupled to the coil element for substantially preventing the first MRI frequency from being detected at the second input/output terminal.

20 Claims, 2 Drawing figures

☐ 13. Document ID: US 6483244 B1 Relevance Rank: 93

L11: Entry 2 of 14 File: USPT Nov 19, 2002

US-PAT-NO: 6483244
DOCUMENT-IDENTIFIER: US 6483244 B1

TITLE: Method of fast start and/or fast termination of a radio frequency resonator

DATE-ISSUED: November 19, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Kawato; Eizo	Kizucho			JP
Ding; Li	Manchester			GB

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Shimadzu Research Laboratory (Europe) Ltd.	Manchester			GB	03

APPL-NO: 09/868751 [PALM]
DATE FILED: July 31, 2001

PCT-DATA:

APPL-NO	DATE-FILED	PUB-NO	PUB-DATE	371-DATE
PCT/GB98/03856	December 21, 1998	WO00/38312	Jun 29, 2000	

INT-CL-ISSUED: [07] H03B 5/12

US-CL-ISSUED: 315/39.51; 331/167
US-CL-CURRENT: 315/39.51; 331/167

FIELD-OF-CLASSIFICATION-SEARCH: 315/39.51, 324/318, 324/322, 331/165, 331/166, 331/167, 331/117FE, 331/173
See application file for complete search history.

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
2939952	June 1960	Paul et al.	
3866145	February 1975	Hess, Jr. et al.	
4801885	January 1989	Meissner et al.	324/318
4833427	May 1989	Leuthold et al.	
5399857	March 1995	Doroshenko et al.	
5517158	May 1996	Gabara	

FOREIGN PATENT DOCUMENTS

FOREIGN-PAT-NO	PUBN-DATE	COUNTRY	CLASS
WO 99/39368	August 1999	WO	
WO 99/39370	August 1999	WO	

ART-UNIT: 2821

PRIMARY-EXAMINER: Wong; Don

ASSISTANT-EXAMINER: Clinger; James

ATTY-AGENT-FIRM: Leydig, Voit & Mayer, Ltd.

ABSTRACT:

A method of fast start and/or fast termination of a radio frequency resonator, which has a coil, a capacitor and two switches with internal resistance wherein one end of the switches is connected to a junction of the coil and the capacitor where a RF voltage is provided, and another end of each switch is connected to high voltage power supplies with opposite polarities, a fast start being achieved by closing one of the switches for a short period of time for fast start, and a fast termination being obtained by closing both switches for a while.

19 Claims, 2 Drawing figures

☐ 14. Document ID: US 6762561 B1 Relevance Rank: 93

L11: Entry 1 of 14 File: USPT Jul 13, 2004

US-PAT-NO: 6762561
DOCUMENT-IDENTIFIER: US 6762561 B1

TITLE: Radio frequency resonator

DATE-ISSUED: July 13, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Kawato; Eizo	Kizucho			JP

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Shimadzu Research Laboratory (Europe) Ltd.	Manchester			GB	03

APPL-NO: 10/221893 [PALM]
DATE FILED: September 17, 2002

PCT-DATA:

APPL-NO	DATE-FILED	PUB-NO	PUB-DATE	371-DATE
PCT/GB00/01239	March 31, 2000	WO01/75935	Oct 11, 2001	

INT-CL-ISSUED: [07] H03B 11/00, H03B 11/08, H03B 11/10

US-CL-ISSUED: 315/39.51; 331/167, 331/165, 331/166, 331/173, 331/128, 315/226, 315/276, 250/292

US-CL-CURRENT: 315/39.51; 250/292, 315/226, 315/276, 331/128, 331/165, 331/166, 331/167, 331/173

FIELD-OF-CLASSIFICATION-SEARCH: 331/165, 331/166, 331/167, 331/173, 331/128, 250/281, 250/282, 250/287, 250/288, 250/292, 315/39.51, 315/209PZ, 315/226, 315/276, 324/318, 324/322, 333/99MP, 363/87, 388/819
See application file for complete search history.

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
2939952	June 1960	Paul et al.	250/292
3866145	February 1975	Hess et al.	331/128
4547706	October 1985	Krummel	315/226
4550297	October 1985	Harrison	333/99MP
4767999	August 1988	VerPlanck	331/166
4801855	January 1989	Nohmi et al.	388/819
4801885	January 1989	Meissner et al.	324/318
4815052	March 1989	Walker	363/87
5243289	September 1993	Blum et al.	324/322
5466992	November 1995	Nemirow et al.	315/276
5663648	September 1997	Chapman et al.	324/322
6124678	September 2000	Bishop et al.	315/209PZ
6483244	November 2002	Kawato et al.	315/39.51

FOREIGN PATENT DOCUMENTS

FOREIGN-PAT-NO	PUBN-DATE	COUNTRY	CLASS
0 926 926	June 1999	EP	
2 326 804	April 1977	FR	
2326804	June 1977	FR	
WO 99/39370	August 1999	WO	
WO 00/38312	June 2000	WO	

OTHER PUBLICATIONS

Blauth, "Dynamic mass spectometers," XP-00215375, p. 110-155 (1966).
Walcher, XP002153716, p. 304-309 (1989).

ART-UNIT: 2881

PRIMARY-EXAMINER: Lee; John R.

ASSISTANT-EXAMINER: El-Shammaa; Mary

ATTY-AGENT-FIRM: Leydig, Voit & Mayer, Ltd.

ABSTRACT:

An apparatus having a radio frequency resonator, which has a coil, a capacitor means and at least one switch means being associated with another capacitor means, a resistor means and a high voltage supply means, one end of the switch means being connected to a junction of the coil and the capacitor means where a radio frequency voltage is provided, another end of the switch means being connected to ground with said another capacitor means and to the high voltage power supply means with the resistor means.

17 Claims, 4 Drawing figures

Clear | Generate Collection | Print | Fwd Refs | Bkwd Refs | Generate OACS

Term	Documents
"4801885"	14
4801885S	0
"4801885".PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD.	14
(4801885).PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD.	14

Display Format: - Change Format

Previous Page Next Page Go to Doc#

Company, LLC Waukesha WI 02

APPL-NO: 10/260603 [PALM]
DATE FILED: September 30, 2002

INT-CL-ISSUED: [07] G01 V 3/00

US-CL-ISSUED: 324/318; 324/322
US-CL-CURRENT: 324/318; 324/322

FIELD-OF-CLASSIFICATION-SEARCH: 324/318, 324/320, 324/322, 324/300, 324/306, 324/307, 324/309, 324/314, 600/421, 600/422
See application file for complete search history.

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
5143688	September 1992	Mansfield	324/318
6223065	April 2001	Misic et al.	600/410
6411090	June 2002	Boskamp	324/318

OTHER PUBLICATIONS

Hayes, Edelestein, Schenck, Mueller, & Eash, "An Efficient, Highly Homogeneous RF Coil for Whole Body MRI at 1.5T," Journal of Magnetic Resonance 63, 1985, p 622.
Roemer, Edelstein, Hayes, Souza & Mueller, "The NMR Phased Array," Magnetic Resonance in Medicine 16, 1990, p 192.

ART-UNIT: 2862

PRIMARY-EXAMINER: Arana; Louis

ATTY-AGENT-FIRM: Heino; Joseph S. Horton; Carl B.

ABSTRACT:

The present invention provides for a body coil modeled after a birdcage coil and based on a ladder network design. A fixed number of single loop coils (N) are equally spaced around a cylinder. These coils must be driven 360.degree./N out of phase with respect to each other azimuthally. Each phase must increase 360.degree./N as azimuthally in order for single loop coil currents to mimic currents commonly seen in the quadrature birdcage coil. A switching circuit is necessary to change the transmit coil configuration and the N channel for phased array reception. This type of coil eliminates the otherwise necessary need to decouple the transmit coil from the receiver coils, but preserves the SNR benefit of having multiple receiver coils. This type of coil will improve SNR over ordinary volume coils and may be necessary imaging large patients where space around the patient is at a minimum.

26 Claims, 6 Drawing figures

☐ 3. Document ID: US 6408202 B1 Relevance Rank: 48

L23: Entry 21 of 30 File: USPT Jun 18, 2002

US-PAT-NO: 6408202
DOCUMENT-IDENTIFIER: US 6408202 B1
**** See image for Certificate of Correction ****

TITLE: Transesophageal magnetic resonance analysis method and apparatus

DATE-ISSUED: June 18, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Lima; Joao A. C.	Timonium	MD		
Shunk; Kendrick A.	Baltimore	MD		
Atalar; Ergin	Columbia	MD		

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
The Johns Hopkins University	Baltimore	MD			02

APPL-NO: 09/432960 [PALM]
DATE FILED: November 3, 1999

PARENT-CASE:
CROSS REFERENCE TO RELATED APPLICATION This application claims the benefit of U.S. Provisional Application Serial No. 60/106,772, filed Nov. 3, 1998.

INT-CL-ISSUED: [07] A61 B 5/05

US-CL-ISSUED: 600/423; 600/410, 600/421, 600/380, 324/307, 324/322
US-CL-CURRENT: 600/423; 324/307, 324/322, 600/380, 600/410, 600/421

FIELD-OF-CLASSIFICATION-SEARCH: 600/373, 600/380, 600/160, 600/417, 600/421, 600/422, 600/423, 600/424, 324/307, 324/318, 324/322, 607/154, 607/156
See application file for complete search history.

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
4572198	February 1986	Codrington	
5050607	September 1991	Bradley et al.	
5154179	October 1992	Ratner	
5170789	December 1992	Narayan et al.	

5211166	May 1993	Sepponen
5348010	September 1994	Schnall et al.
5355087	October 1994	Claiborne et al.
5417713	May 1995	Cohen
5419325	May 1995	Dumoulin et al.
5432450	July 1995	Rubinson
5546951	August 1996	Ben-Haim
5699801	December 1997	Atalar et al.
5792055	August 1998	McKinnon
5928145	July 1999	Ocali et al.
6120442	September 2000	Hickey

OTHER PUBLICATIONS

Thomas, A.C., et al., "Potential errors in the estimation of coronary arterial stenosis from clinical arteriography with reference to the shape of the coronary arterial lumen," British Heart Journal, 1986, pp. 129-139, vol. 55.
Zerhouni, E.A., et al., "Human heart: tagging with MR imaging--a method for noninvasive assessment of myocardial motion," Radiology, 1988, pp. 59-63, vol. 169.

Narayan, P., et al., "Transrectal probe for .sup.1 H and .sup.31 P MR spectroscopy of the prostate gland," Magnetic Resonance in Medicine, 1989, pp. 209-220, vol. 11.

Schnall, M.D., et al., "Prostate: MR imaging with an endorectal with an endorectal surface coil," Radiology, 1989, pp. 570-574, vol. 172.
Witteman, J.C., et al., "Aortic calcified plaques and cardiovascular disease (the Framingham Study)," American Journal of Cardiology, 1990, pp. 1060-1064, vol. 66.
McVeigh, E.R., et al., "Cardiac tagging with breath-hold cine MRI," Magnetic Resonance in Medicine, 1992, pp. 318-327, vol. 28.
Fazio, G.P., et al., "Transesophageal echocardiographically detected atherosclerotic aortic plaque is a marker for coronary artery disease," Journal of the American College of Cardiology, 1993, pp. 144-150, vol. 21.
Amarenco, P., et al., "Atherosclerotic disease of the aortic arch and the risk of ischemic stroke," New England Journal of Medicine, 1994, pp. 1474-1479, vol. 331.
Atalar, E., et al., "Minimization of dead-periods in MRI pulse sequences for imaging oblique planes," Magnetic Resonance in Medicine, 1994, pp. 773-777, vol. 32.
Libby, P., "Lesion versus lumen," Nature Medicine, 1995, pp. 17-18, vol. 1.
Martin, A.J., et al., "High-resolution MR imging of human arteries," Journal of Magnetic Resonance Imaging, 1995, pp. 93-100, vol. 5.
Toussaint, J.F., et al., "T.sub.2 -weighted contrast for NMR characterization of human atherosclerosis," Arteriosclerosis, Thrombosis and Vascular Biology, 1995, pp. 1533-1542, vol. 15.
Kasprzak, J.D., et al., "Three-dimensional echocardiography of the thoracis aorta," European Heart Journal, 1996, pp. 1584-1592, vol. 17.
Montgomery, D.H., et al., "Natural history of severe atheromatous disease of the thoracic aorta: a transesophageal echocardiographic study," Journal of the American College of Cardiology, 1996, pp. 95-101, vol. 27.
Toussaint, J.F., "Magnetic resonance images lipid, fibrous, calcified, hemmorrhagic, and thrombotic components of human atherosclerosis in vivo," Circulation, 1996, pp. 932-938, vol. 94.
Atalar, E., et al., "High resolution intravascular MRI and MRS using a catheter receiver coil," Magnetic Resonance in Medicine, 1996, pp. 596-605, vol. 36.
Tomochika, Y., et al., "Improvement of atherosclerosis and stiffness of the thoracic descending aorta with cholesterol-lowering therapies in familial hypercholesterolemia," Arteriosclerosis, Thrombosis and Vascular Biology, 1996, pp.

955-962, vol. 16.
Martin, A.J., et al., "Arterial imaging: comparison of high-resolution US and MR imaging with histologic correlation," Radiographics, 1997, pp. 189-202, vol. 17.
Cohen, A., et al., "Aortic plaque morphology and vascular events: a follow-up study in patients with ischemic stroke. FAPS Investigators. French Study of Aortic Plaques in Stroke," Circulation, 1997, pp. 3838-3841, vol. 96.
Siegelman, E.S., et al., "High-resolution MR imaging of the vagina," Radiographics, 1997, pp. 1183-1203, vol. 17.
Ocali, O., et al., "Intravascular magnetic resonance imaging using a loopless catheter antenna," Magnetic Resonance in Medicine, 1997, pp. 112-118, vol. 37.
Toussaint, J.F., "Water diffusion properties of human atherosclerosis and thrombosis measured by pulse field gradient nuclear magnetic resonance," Arteriosclerosis, Thrombosis and Vascular Biology, 1997, pp. 542-546, vol. 17.
Correia, L.C.L., et al., "Intravascular magnetic resonance imaging of aortic atherosclerotic plaque composition," Arteriosclerosis, Thrombosis and Vascular Biology, 1997, pp. 3626-3632, vol. 17.
Matsumura, Y., et al., "Atherosclerotic aortic plaque detected by transesophageal echocardiography: its significance and limitation as a marker for coronary artery disease in the elderly," Chest, 1997, pp. 81-86, vol. 112.
Khoury, Z., t al., "Frequency and distribution of atherosclerotic plaques in the thoracic aorta as determined by transesophageal echocardiography in patients with coronary artery disease," American Journal of Cardiology, 1997, pp. 23-27, vol. 79.

Yuan, C., et al. "In vitro and in situ magnetic resonance imaging signal features of atherosclerotic plaque-associated lipids," Arteriosclerosis, Thrombosis and Vascular Biology, 1997, pp. 1496-503, vol. 17.
Constantinides, C.D., et al., Signal-to-noise measurement in magnitude imaging from NMR phased arrays, Magnetic Resonance in Medicine, 1997, pp. 852-857, vol. 38.
Martin, A.J., et al., "An expandable intravenous RF coil for arterial wall imaging," Journal of Magnetic Resonance Imaging, 1998, pp. 226-234, vol. 8.
Atalar, E., et al., "Catheter-tracking FOV MR fluoroscopy," Magnetic Resonance in Medicine, Dec. 198, pp. 865-872, vol. 40(6).
Ferrari, E., et al., Atherosclerosis of the thoracic aorta and aortic debris in a marker of poor prognosis: benefit of oral anticoagulants, Journal of the American College of Cardiology, Apr. 1999, pp. 1317-1322, vol. 33.

ART-UNIT: 3737

PRIMARY-EXAMINER: Lateef; Marvin M.

ASSISTANT-EXAMINER: Qaderi; Runa Shah

ATTY-AGENT-FIRM: Houser; Kirk D. Eckert Seamans Cherin & Mellott, LLC

ABSTRACT:

A method of transesophageal magnetic resonance analysis of a patient, such as an animal or human, includes providing a loopless antenna formed from a flexible coaxial cable having an extended center conductor at the distal end thereof. A distal portion of the loopless antenna is secured within a Levin-type gastric tube. The gastric tube which receives the loopless antenna is inserted in the esophagus of the patient. A tuning, matching and decoupling circuit for the loopless antenna is employed external to the patient. The tuning, matching and decoupling circuit is electrically connected to a magnetic resonance imaging scanner. The magnetic resonance imaging scanner is employed to display an image of the aorta of the patient.

51 Claims, 20 Drawing figures

☐ 4. Document ID: US 6549800 B1 Relevance Rank: 45

L23: Entry 19 of 30 File: USPT Apr 15, 2003

US-PAT-NO: 6549800
DOCUMENT-IDENTIFIER: US 6549800 B1

TITLE: Methods for in vivo magnetic resonance imaging

DATE-ISSUED: April 15, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Atalar; Ergin	Columbia	MD		
Bottomley; Paul A.	Columbia	MD		
Zerhouin; Elias	Pasadena	MD		
Halperin; Henry	Baltimore	MD		
McVeigh; Elliot	Potomac	MD		
Lardo; Albert C.	Lutherville	MD		

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Johns Hopkins Unversity School of Medicine	Baltimore	MD			02

APPL-NO: 09/549921 [PALM]
DATE FILED: April 14, 2000

PARENT-CASE:
REFERENCE TO PRIOR APPLICATIONS This application claims the benefit of U.S. Provisional Patent Application No. 60/129,368 filed Apr. 15, 1999, U.S. Provisional Patent Application No. 60/129,364, filed Apr. 15, 1999, U.S. Provisional Patent Application No. 60/192,133 filed Mar. 24, 2000, and is a continuation-in-part of U.S. patent application Ser. No. 09/536,090 to Albert C. Lardo et al., filed Mar. 24, 2000, and is also a continuation-in-part of U.S. patent application Ser. No. 09/360,144 to Ocali et al., filed Jul. 26, 1999, which is a continuation-in-part of U.S. patent application Ser. No. 08/638,934 to Ocali et al., filed Apr. 25, 1996, now U.S. Pat. No. 5,928,145, issued Jul. 27, 1999. The disclosures of these applications are incorporated herein by reference.

INT-CL-ISSUED: [07] A61 B 5/05

US-CL-ISSUED: 600/423; 600/407, 600/410, 600/415, 600/417, 600/424, 606/130, 324/301, 324/244, 324/256, 324/257, 324/260
US-CL-CURRENT: 600/423; 324/244, 324/256, 324/257, 324/260, 324/301, 600/407, 600/410, 600/415, 600/417, 600/424, 606/130

FIELD-OF-CLASSIFICATION-SEARCH: 600/423, 600/407, 600/409, 600/410, 600/415,

600/417, 600/424, 324/300, 324/301, 324/302, 324/244, 324/256, 324/257, 324/260, 324/200, 606/130
See application file for complete search history.

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
3342175	September 1967	Bulloch	128/2
4431005	February 1984	McCormick	128/656
4445501	May 1984	Bresler	128/1.5
4572198	February 1986	Codrinton	128/653
4643186	February 1987	Rosen et al.	128/303.1
4672972	June 1987	Berke	128/653
4766381	August 1988	Conturo et al.	324/309
4776341	October 1988	Bachus et al.	128/653
4791372	December 1988	Kirk et al.	324/318
4793356	December 1988	Misic et al.	128/653
4813429	March 1989	Eshel et al.	128/736
4823812	April 1989	Eshel et al.	128/804
4858613	August 1989	Fry et al.	128/660.03
4897604	January 1990	Carlson et al.	324/318
4922204	May 1990	Duerr et al.	324/322
4932411	June 1990	Fritschy et al.	128/653
4960106	October 1990	Kubokawa	128/6
5019075	May 1991	Spears et al.	606/7
5035231	July 1991	Kubokawa et al.	128/6
5050607	September 1991	Bradley et al.	128/653A
5090959	February 1992	Samson et al.	604/96
5095911	March 1992	Pomeranz	128/662.06
5099208	March 1992	Fitzpatrick et al.	324/312
5167233	December 1992	Eberle et al.	128/662.06
5170789	December 1992	Narayan et al.	128/653.5
5190046	March 1993	Shturman	128/662.06
5211165	May 1993	Dumoulin et al.	128/653.1
5211166	May 1993	Sepponen	128/653.5
5217010	June 1993	Tsitlik et al.	128/419PG
5260658	November 1993	Greim et al.	324/322
5270485	December 1993	Jacobsen	174/15.1
5271400	December 1993	Dumoulin et al.	128/653.2
5293872	March 1994	Alfano et al.	128/664
5294886	March 1994	Duerr	324/318
5307808	May 1994	Dumoulin et al.	128/653.2
5307814	May 1994	Kressel et al.	128/653.5
5318025	June 1994	Dumoulin et al.	128/653.2
5347221	September 1994	Rubinson	324/318

5348010	September 1994	Schnall et al.	128/653.2
5352979	October 1994	Conturo	324/307
5355087	October 1994	Claiborne et al.	324/322
5358515	October 1994	Huter et al.	607/101
5365928	November 1994	Rhinehart et al.	128/653.5
5370644	December 1994	Langberg	606/33
5372138	December 1994	Crowley et al.	128/662.06
5375596	December 1994	Twiss et al.	128/653.1
5400787	March 1995	Marandos	128/653.5
5411476	May 1995	Abrams et al.	604/95
5413104	May 1995	Buijs et al.	128/653.5
5419325	May 1995	Dumoulin et al.	128/653.2
5421338	June 1995	Crowley et al.	128/662.06
5429132	July 1995	Guy et al.	128/653.1
5435302	July 1995	Lenkinski et al.	600/422
5437277	August 1995	Dumoulin et al.	128/653.1
5439000	August 1995	Gunderson et al.	128/664
5443066	August 1995	Dumoulin et al.	128/653.1
5443489	August 1995	Ben-Haim	607/115
5447156	September 1995	Dumoulin et al.	128/653.2
5451232	September 1995	Rhinehart et al.	606/192
5451774	September 1995	Jacobsen	250/227.24
5462055	October 1995	Casey et al.	128/653.5
5476095	December 1995	Schnall et al.	128/653.2
5498261	March 1996	Strul	606/29
5507743	April 1996	Edwards et al.	606/41
5512825	April 1996	Atalar et al.	324/309
5520644	May 1996	Imran	604/95
5524630	June 1996	Crowley et al.	128/662.06
5540679	July 1996	Fram et al.	606/27
5558093	September 1996	Pomeranz	128/660.03
5578008	November 1996	Hara	604/96
5588432	December 1996	Crowley	128/660.03
5598097	January 1997	Scholes et al.	324/316
5609606	March 1997	O'Boyle	606/194
5611807	March 1997	O'Boyle	606/169
5623241	April 1997	Minkoff	335/296
5647361	July 1997	Damadian	128/683.2
5660180	August 1997	Malinowski et al.	128/660.03
5682897	November 1997	Pomeranz	128/662.06
5699801	December 1997	Atalar et al.	128/653.2
5715825	February 1998	Crowley	128/602.06
5728079	March 1998	Weber et al.	604/280
5738632	April 1998	Karasawa	600/410
5775338	July 1998	Hastings	128/898
5792055	August 1998	McKinnon	600/410
5833608	November 1998	Acker	600/409

5833632	November 1998	Jacobsen et al.	600/585
5840031	November 1998	Crowley	600/440
5868674	February 1999	Glowinski et al.	600/410
5916162	June 1999	Snelten et al.	600/411
5928145	July 1999	Ocali et al.	600/410
5938609	August 1999	Pomeranz	600/439
5938692	August 1999	Rudie	607/101
5964705	October 1999	Truwit et al.	600/423
5968052	October 1999	Sullivan, III et al.	606/108
6004269	December 1999	Crowley et al.	600/439
6011995	January 2000	Guglielmi et al.	607/99
6171240	January 2000	Young et al.	600/410
6019737	February 2000	Murata	600/585
6026316	February 2000	Kucharczyk et al.	600/420
6031375	February 2000	Atalar et al.	324/307
6032078	February 2000	Rudie	607/101
6051974	April 2000	Reisker et al.	324/318
6058323	May 2000	Lemelson	600/408
6061587	May 2000	Kurcharczyk et al.	600/411
6078831	June 2000	Belef et al.	600/424
6104943	August 2000	Frederick et al.	600/410
6263229	July 2001	Atalar et al.	600/423
6332089	December 2001	Acker et al.	600/424

FOREIGN PATENT DOCUMENTS

FOREIGN-PAT-NO	PUBN-DATE	COUNTRY	CLASS
0 659 385	June 1995	EP	
0 673 621	September 1995	EP	
0 768 539	April 1997	EP	
0 850 595	July 1998	EP	
0 908 739	April 1999	EP	
6-70902	March 1994	JP	
WO 98/52064	November 1998	WO	
WO 98/52461	November 1998	WO	
WO 99/18852	April 1999	WO	
WO 99/59479	November 1999	WO	

OTHER PUBLICATIONS

Edelman et al., "Magnetic Resonance Imaging" NEJM. 328: 708-716 (1993).
Ladd et al.; "Guidewire Antennas for MR Fluoroscopy", Magnetic Resonance in Medicine, Academic Press, Duluth, MN, US., vol. 37(6): 891-897, (Jun. 1, 1997).
Martin et al.; "An Expandable Intravenous RF Coil For Imaging the Artery Wall", Proceeding of the International Society For Magnetic Resonance In Medicine, Fourth Scientific Meeting and Exhibition, New York, USA Apr. 27-May 3, 1996, vol. 1, page 402.
Quick et al; "Vascular Stents as RF-Antennas for Intravascular MR-Guidance and-Imaging", Proceedings of the International Society for Magnetic Resonance in

Medicine, Seventh Scientific Meeting and Exhibition, Philadelphia, Pennsylvania, USA May 22-28, 1999, vol. 1, page 577.
Atalar et al.,;"High Resolution Intravascular MRI and MRS using A Catheter Receiver Coil,", Magnetic Resonance in Medicine, 36:596-605 (1996).
Farmer et al.;"Implanted Coil MR Microscopy of RenalPathology", Magn. Reson. Med., 10: 310-323 (1989).
Hoult et al,; " The Signal-to-Noise Ratio of the Nuclear Magnetic Resonance Experiment"J. Magn. Reson. , 24:71-85 (1976).
Hoult; "Rotating Frame Zeugmatography", Phil. Trans. R. Soc. Lond. B. 289:543-547 (1980).
Jolesz et al.; "Interventional Magnetic Resonance Therapy", Seminars in Interventional Radiology, 12: 20-27 (1995).
Ocali et al.;"Intravascular Magnetic Resonance Imaging Using a Loopless Catheter Antenna", MRM, 37:112-118 (1997).
Silverman et al.;"Interactive MR-guided Biopsy in an Open configuration MR Imaging System", Radiology, 197: 175-181 (1995).

ART-UNIT: 3737

PRIMARY-EXAMINER: Lateef; Marvin M.

ASSISTANT-EXAMINER: Lin; Jeoyuh

ATTY-AGENT-FIRM: Foley Hoag LLP

ABSTRACT:

The systems and methods of the present invention provide for MRI probes adapted for insertion into a plurality of body orifices, in order to evaluate the anatomy of proximate anatomic structures, to diagnose abnormalities thereof and to treat the diagnosed abnormalities. MRI probes are described that are suitable for use in the mediastinum, in the pancreaticohepaticobiliary system, in the tracheobronchopulmonary system, in the head and neck, in the genitourinary system, the gastrointestinal system, the vascular system, and in the evaluation, diagnosis and treatment of internal fluid collections.

148 Claims, 11 Drawing figures

☐ 5. Document ID: US 20030028094 A1 Relevance Rank: 45

L23: Entry 10 of 30 File: PGPB Feb 6, 2003

PGPUB-DOCUMENT-NUMBER: 20030028094
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20030028094 A1

TITLE: Biopsy and sampling needle antennas for magnetic resonance imaging-guided biopsies

PUBLICATION-DATE: February 6, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Kumar, Ananda	Baltimore	MD	US
Atalar, Ergin	Columbia	MD	US
Ocali, Ogan	Sunnyvale	CA	US

APPL-NO: 10/131601 [PALM]
DATE FILED: April 24, 2002

RELATED-US-APPL-DATA:
Application 10/131601 is a continuation-in-part-of US application 09/360144, filed July 26, 1999, PENDING
Application 09/360144 is a continuation-in-part-of US application 08/638934, filed April 25, 1996, US Patent No. 5928145
Application is a non-provisional-of-provisional application 60/286271, filed April 25, 2001,

INT-CL-PUBLISHED: [07] A61 B 5/05

US-CL-PUBLISHED: 600/410; 600/411, 600/423
US-CL-CURRENT: 600/410; 600/411, 600/423

REPRESENTATIVE-FIGURES: 18 19

ABSTRACT:

Herein is disclosed a magnetic resonance imaging antenna, including an inner conductor, an outer shield slideably displaceable with respect to the inner conductor, and an insulator electrically insulating the inner conductor from the outer shield. Herein is disclosed a biopsy needle antenna, including a magnetic resonance imaging antenna, having an outer shield, and an inner conductor electrically insulated from the outer shield by a dielectric; and a biopsy needle electrically connected to the inner conductor and electrically insulated from the outer shield by the dielectric. Herein is disclosed a method of obtaining a sample with magnetic resonance imaging guidance, including providing a sampling needle magnetic resonance imaging antenna, advancing the antenna to a structure from which the sample is to be taken, detecting magnetic resonance data by the antenna, and coupling the sample to the antenna.

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is a continuation-in-part of U.S. patent application Ser. No. 09/360,144, filed Jul. 26, 1999, which is a continuation-in-part of U.S. patent application Ser. No. 08/638,934, filed Apr. 25, 1996, now U.S. Pat. No. 5,928,145. This application also claims benefit of priority to U.S. Provisional patent application Serial No. 60/286,271, filed Apr. 24, 2001, entitled "Biopsy Needle Antenna for MR Guided Biopsies." The aforementioned applications are incorporated herein in their entireties by this reference.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KMC | Draw D

☐ 6. Document ID: US 6177797 B1 Relevance Rank: 42

L23: Entry 22 of 30 File: USPT Jan 23, 2001

US-PAT-NO: 6177797
DOCUMENT-IDENTIFIER: US 6177797 B1

TITLE: Radio-frequency coil and method for resonance/imaging analysis

DATE-ISSUED: January 23, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Srinivasan; Ravi	Richmond Heights	OH		

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Advanced Imaging Research, Inc.	Cleveland	OH			02

APPL-NO: 08/993932 [PALM]
DATE FILED: December 18, 1997

PARENT-CASE:
CROSS-REFERENCE TO RELATED APPLICATION This application claims the benefit of U.S. Provisional Patent Application No. 60/033,611, filed Dec. 19, 1996.

INT-CL-ISSUED: [07] G01 V 3/00

US-CL-ISSUED: 324/318; 324/322
US-CL-CURRENT: 324/318; 324/322

FIELD-OF-CLASSIFICATION-SEARCH: 324/318, 324/322, 324/312, 324/314, 324/307, 324/309, 324/300
See application file for complete search history.

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
4411270	October 1983	Damadian	
4793356	December 1988	Misic et al.	
4799016	January 1989	Rezvani	
4820985	April 1989	Eash	
4825162	April 1989	Roemer et al.	
4833409	May 1989	Eash	
4943775	July 1990	Boskamp et al.	
5057778	October 1991	Rath	
5144240	September 1992	Mehdizadeh et al.	
5208534	May 1993	Okamoto et al.	
5258717	November 1993	Misic et al.	
5270656	December 1993	Roberts et al.	

5382903	January 1995	Young	
5521506	May 1996	Misic et al.	
5543711	August 1996	Srinivasan et al.	324/318
5548218	August 1996	Lu	
5592088	January 1997	Matsunaga et al.	
5602479	February 1997	Srinivasan et al.	324/318
5646531	July 1997	Renz	324/318
5680047	October 1997	Srinivasan et al.	

OTHER PUBLICATIONS

International Search Report related to PCT Patent Application No. PCT/US98/03529 dated Jul. 16, 1998.
"A Comprehensive Analysis for Estimating Modes in Coupled Resonators" by Ravi Srinivasan and Haiying Liu, pp 1425.
"Examples of the Design of Screened and Shielded RF Receiver Coils", by Michael Burl and Ian R. Young, pp 326-330.

ART-UNIT: 282

PRIMARY-EXAMINER: Arana; Louis

ATTY-AGENT-FIRM: Renner, Otto, Boisselle & Sklar

ABSTRACT:

An RF coil with high signal-to-noise (S/N) and B.sub.1 homogeneity over the volume originating from the arctic arch and extending to the top of the head, which is highly desirable for quantitative (anatomical, vascular and functional) studies in-vivo. The coil is suitable for use in performing multiple studies and reducing scan time without patient repositioning. Moreover, the coil is capable of imaging in different operating modes. A split-top design is used to ease patient access.

34 Claims, 16 Drawing figures

☐ 7. Document ID: US 20050275403 A1 Relevance Rank: 42

L23: Entry 3 of 30 File: PGPB Dec 15, 2005

PGPUB-DOCUMENT-NUMBER: 20050275403
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20050275403 A1

TITLE: Transceive surface coil array for magnetic resonance imaging and spectroscopy

PUBLICATION-DATE: December 15, 2005

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Pinkerton, Robert G.	Harrowsmith		CA
Menon, Ravi S.	London		CA

APPL-NO: 11/085800 [PALM]
DATE FILED: March 21, 2005

RELATED-US-APPL-DATA:
Application is a non-provisional-of-provisional application 60/554350, filed March 19, 2004,

INT-CL-PUBLISHED: [07] G01 V 3/00

US-CL-PUBLISHED: 324/318; 324/322
US-CL-CURRENT: 324/318; 324/322

REPRESENTATIVE-FIGURES: 1

ABSTRACT:

A surface coil array comprises a surface coil support and an arrangement of non-overlapping magnetically decoupled surface coils mounted on the support. The surface coils encompass a volume into which a target to be imaged is placed. Magnetic decoupling circuits act between adjacent surface coils. Impedance matching circuitry couples the surface coils to conventional transmit and receive components.

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of U.S. Provisional Patent Application No. 60/554,350 filed on Mar. 19, 2004 for an invention entitled "Transceive Surface Coil Array For Magnetic Resonance Imaging and Spectroscopy".

☐ 8. Document ID: US 5450011 A Relevance Rank: 41

L23: Entry 25 of 30 File: USPT Sep 12, 1995

US-PAT-NO: 5450011
DOCUMENT-IDENTIFIER: US 5450011 A

TITLE: Magnetic resonance apparatus having a wideband matching network

DATE-ISSUED: September 12, 1995

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Boeijen; Gerardus W.	Eindhoven			NL
Wardenier; Peter H.	Eindhoven			NL

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
U.S. Philips Corporation	New York	NY			02

APPL-NO: 08/041803 [PALM]
DATE FILED: April 1, 1993

FOREIGN-APPL-PRIORITY-DATA:

COUNTRY	APPL-NO	APPL-DATE
EP	92201295	May 7, 1992

INT-CL-ISSUED: [06] G01 R 33/36

US-CL-ISSUED: 324/322; 324/318
US-CL-CURRENT: 324/322; 324/318

FIELD-OF-CLASSIFICATION-SEARCH: 324/318, 324/322, 324/300, 324/307, 324/309, 128/653.5
See application file for complete search history.

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
4095168	June 1978	Hlavka	324/310
4691164	September 1987	Haragashira	324/322
4694255	September 1987	Hayes	324/318
4700137	October 1987	Yoda	324/322
4739271	April 1988	Haase	324/322
4755756	July 1988	Nishihara et al.	324/300
4827219	May 1989	Harrison	324/322
4882541	November 1989	Haragashira	324/322
4885541	December 1989	Hayes	324/322
4920315	April 1990	Hokbrook et al.	324/313
5055792	October 1991	Keren	324/318
5172061	December 1992	Crooks et al.	324/318

FOREIGN PATENT DOCUMENTS

FOREIGN-PAT-NO	PUBN-DATE	COUNTRY	CLASS
0083728	July 1983	EP	

OTHER PUBLICATIONS

Journal of Physics E. Scientific Instruments, vol. 14, No. 6, 1 Jun. 1981, Bristol GB pp. 700-701.
Magnetic Resonance in Medicine, vol. 3, No. 2, 1 Apr. 1986, Duluth, Minn., pp. 346-351.
"Electronics", Jan. 1944, pp. 130-133 and 318-325.

ART-UNIT: 268

PRIMARY-EXAMINER: O'Shea; Sandra L.

ASSISTANT-EXAMINER: Mah; Raymond Y.

ATTY-AGENT-FIRM: Franzblau; Bernard

ABSTRACT:

A magnetic resonance apparatus includes an RF coil tuned to a predetermined frequency and which is connected, via a connection circuit, to a transmission and/or receiving device for RF signals. A connection circuit is provided in order to increase the bandwidth of the RF coil without imposing restrictions on the design and the construction of the coil. Therefore, viewed from the RF, the connection circuit successively includes the following elements:

a first matching network which is operative to transform an impedance connected to its output to a substantially lower value;

a circuit which has the properties of a transmission line whose effective length is substantially equal to an integer number of times one half wavelength at the frequency to which the RF coil is tuned and whose characteristic impedance is substantially equal to the input impedance of the first matching network; and

a second matching network which is operative to transform an impedance connected to its output to a substantially higher value.

18 Claims, 9 Drawing figures

☐ 9. Document ID: US 20060033501 A1 Relevance Rank: 40

L23: Entry 1 of 30 File: PGPB Feb 16, 2006

PGPUB-DOCUMENT-NUMBER: 20060033501
PGPUB-FILING-TYPE:
DOCUMENT-IDENTIFIER: US 20060033501 A1

TITLE: RF coil for imaging system

PUBLICATION-DATE: February 16, 2006

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Vaughan; J. Thomas JR.	Stillwater	MN	US

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	COUNTRY	TYPE	CODE

The General Hospital Corporation d/b/a Massachusetts General Hospital 02

APPL-NO: 11/196131 [PALM]
DATE FILED: August 3, 2005

RELATED-US-APPL-DATA:
parent US continuation 10750031 20031229 ABANDONED
child US 11196131 A1 20050803
parent US continuation 10367489 20030214 PENDING
child US 10750031 20031229
parent US division 09575384 20000522 GRANTED
parent-grant-document US 6633161
child US 10367489 20030214
us-provisional-application US 60135269 19990521

INT-CL-PUBLISHED:

TYPE	IPC	DATE	IPC-OLD
IPCP	G01V3/00	20060101	G01V003/00

INT-CL-CURRENT:

TYPE	IPC	DATE
CIPP	G01 V 3/00	20060101

US-CL-PUBLISHED: 324/322; 324/318
US-CL-CURRENT: 324/322; 324/318

ABSTRACT:

An RF coil suitable for use in imaging systems is provided which coil has a dielectric filled cavity formed by a surrounding conducting enclosure, the conducting enclosure preferably being patterned to form continuous electrical paths around the cavity, each of which paths may be tuned to a selected resonant frequency. The patterning breaks up any currents inducted in the coil and shortens path lengths to permit higher frequency, and thus higher field strength operation. The invention also includes improved mechanisms for tuning the resonant frequency of the paths, for selectively detuning the paths, for applying signal to the coil, for shortening the length of the coil and for controlling the field profile of the coil and the delivery of field to the object to the image.

RELATED APPLICATIONS

[0001] This application is a continuation of U.S. patent application Ser. No. 10/750,031, filed Dec. 29, 2003, entitled "RF Coil for Imaging System," by J. T. Vaughan, which is a continuation of U.S. patent application Ser. No. 10/367,489, filed Feb. 14, 2003, entitled "RF Coil for Imaging System," by J. T. Vaughan, which application is a divisional of U.S. patent application Ser. No. 09/575,384, filed May 22, 2000, now issued U.S. Pat. No. 6,633,161, (Oct. 14, 2003), entitled "RF Coil for Imaging System," by J. T. Vaughan, which application claims the benefit of U.S. Provisional Patent Application Ser. No. 60/135,269, filed May 21, 1999, entitled "RF Coil for Imaging System," by J. T. Vaughan, each of which is incorporated herein by reference.

☐ 10. Document ID: US 20040140808 A1 Relevance Rank: 40

L23: Entry 7 of 30 File: PGPB Jul 22, 2004

PGPUB-DOCUMENT-NUMBER: 20040140808
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20040140808 A1

TITLE: RF coil for imaging system

PUBLICATION-DATE: July 22, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Vaughan, J. Thomas JR.	Stillwater	MN	US

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	COUNTRY	TYPE CODE
The General Hospital Corporation d/b/a Massachusetts General Hospital				02

APPL-NO: 10/750031 [PALM]
DATE FILED: December 29, 2003

RELATED-US-APPL-DATA:
child 10750031 A1 20031229
parent continuation-of 10367489 20030214 US PENDING
child 10367489 20030214 US
parent division-of 09575384 20000522 US GRANTED
parent-patent 6633161 US
non-provisional-of-provisional 60135269 19990521 US

INT-CL-PUBLISHED: [07] G01 V 3/00

US-CL-PUBLISHED: 324/318; 324/322
US-CL-CURRENT: 324/318; 324/322

REPRESENTATIVE-FIGURES: 1B 5A

ABSTRACT:

An RF coil suitable for use in imaging systems is provided which coil has a dielectric filled cavity formed by a surrounding conducting enclosure, the conducting enclosure preferably being patterned to form continuous electrical paths around the cavity, each of which paths may be tuned to a selected resonant frequency. The patterning breaks up any currents inducted in the coil and shortens path lengths to permit higher frequency, and thus higher field strength operation. The invention also includes improved mechanisms for tuning the resonant frequency of the paths, for selectively detuning the paths, for applying signal to the coil, for shortening the length of the coil and for controlling the field profile of the coil and the delivery of field to the object to the image.

RELATED APPLICATIONS

[0001] This application is a continuation of U.S. patent application Ser. No. 10/367,489, filed Feb. 14, 2003, entitled "RF Coil for Imaging System," by J. T. Vaughan, which application is a divisional of U.S. patent application Ser. No. 09/575,384, filed May 22, 2000, now issued Patent No. 6,633,161, (Oct. 14, 2003), entitled "RF Coil for Imaging System," by J. T. Vaughan, which application claims the benefit of U.S. Provisional Patent Application Serial No. 60/135,269, filed May 21, 1999, entitled "RF Coil for Imaging System," by J. T. Vaughan, each of which is incorporated herein by reference.

☐ 11. Document ID: US 6633161 B1 Relevance Rank: 40

L23: Entry 15 of 30 File: USPT Oct 14, 2003

US-PAT-NO: 6633161
DOCUMENT-IDENTIFIER: US 6633161 B1

TITLE: RF coil for imaging system

DATE-ISSUED: October 14, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Vaughan, Jr.; J. Thomas	Stillwater	MN		

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
The General Hospital Corporation	Boston	MA			02

APPL-NO: 09/575384 [PALM]
DATE FILED: May 22, 2000

PARENT-CASE:
RELATED APPLICATIONS This application claims the benefit of U.S. patent application Ser. No. 09/575,384, filed May 22, 2000, entitled "RF Coil for Imaging System," by J. T. Vaughan, which application claims the benefit of U.S. Provisional Patent Application Serial No. 60/135,269, filed May 21, 1999, entitled "RF Coil for Imaging System and Use Therein," by J. T. Vaughan, each of which is incorporated herein by reference.

INT-CL-ISSUED: [07] G01 V 3/00

US-CL-ISSUED: 324/318; 324/322
US-CL-CURRENT: 324/318; 324/322

FIELD-OF-CLASSIFICATION-SEARCH: 324/318, 324/322, 324/312, 324/316, 324/300, 324/306, 324/307, 324/309
See application file for complete search history.

PRIOR-ART-DISCLOSED:

L23: Entry 12 of 30 File: USPT May 24, 2005

DOCUMENT-IDENTIFIER: US 6898454 B2
TITLE: Systems and methods for evaluating the urethra and the periurethral tissues

Abstract Text (1):
The present invention provides systems and methods for the evaluation of the urethra and periurethral tissues using an MRI coil adapted for insertion into the male, female or pediatric urethra. The MRI coil may be in electrical communication with an interface circuit made up of a tuning-matching circuit, a decoupling circuit and a balun circuit. The interface circuit may also be in electrical communication with a MRI machine. In certain practices, the present invention provides methods for the diagnosis and treatment of conditions involving the urethra and periurethral tissues, including disorders of the female pelvic floor, conditions of the prostate and anomalies of the pediatric pelvis.

Brief Summary Text (3):
The invention relates in general to magnetic resonance imaging (MRI), and in particular to devices for in vivo MRI.

Brief Summary Text (12):
Evaluation of incontinence presently relies upon routine diagnostic tools such as history and physical examination, combined with specialized studies such as cystometrogram, electrophysiologic sphincter testing, bladder and renal ultrasound, cystourethroscopy, uroflowmetry, and videourodynamic evaluation. Ultrasound has been used transurethrally to evaluate the anatomy and function of the rhabdosphincter in the male urethra. Transvaginal ultrasound and intraurethral ultrasound have been employed in female patients also, to evaluate urinary incontinence.

Brief Summary Text (13):
The advent of intracavity magnetic resonance imaging (MRI) receiver coils for high-resolution clinical imaging of the prostate and of the uterine cervix has shown some promise as a technique for imaging the pelvic floor with increased spatial resolution compared to images acquired with the MRI body coil alone. Driven by a motivation to further increase the signal-to-noise (SNR) ratio at the region of interest, authors have reported the value of these intracavitary coils in the detailed demonstration of the female pelvic anatomy and abnormalities using a transrectal imaging approach as well as transvaginal approach for imaging. External MRI of the urethra and pelvic floor has been carried out in female volunteers and patients to elucidate the relevant regional anatomy. Endorectal and external MRI investigation has also been carried out to evaluate abnormalities of the urethral and periurethral tissues. Despite these efforts, clinical and radiological evaluation of these areas remains difficult and not completely satisfying. Although high-resolution magnetic resonance imaging with phased array pelvic, endorectal and endovaginal coils has dramatically enhanced the ability to visualize abnormalities of the female urethral and periurethral tissues, discussion and controversy still continues about the anatomy of this region.

Brief Summary Text (16):
It is understood that diagnostic techniques may be combined with therapeutic techniques for pelvic conditions. A better understanding of regional and local

anatomy and an appreciation of the relevant pathology may facilitate accurate and effective treatment. There remains a need in the art for diagnostic techniques that are combinable with therapeutic modalities useful for malignant and nonmalignant conditions in the pelvic region.

Brief Summary Text (17):
Techniques of magnetic resonance imaging (MRI) or magnetic resonance spectroscopy (MRS), specialized radiofrequency (RF) may be applicable to these diagnostic and therapeutic problems. RF receiver coils may be placed at the region of interest to increase the signal-to-noise ratio (SNR) for better image (spectrum) quality in MRI or MRS. RF Receiver coils can broadly be separated into categories of volume coils, surface coils and endoluminal coils. Volume coils contain the region of interest within their volume and the imaging region is directed toward the inside of the coil. Surface coils are placed on top of the region of interest and their imaging region is directed to either side of the coil. Endoluminal coils are inserted into natural (urethra, prostate, vagina, rectum, oesophagus, pancreas, etc.) or artificial (endovascular, etc.) orifices of the human or animal body. Their imaging region is directed towards the outside of the coil to provide high-resolution imaging (spectra) of the region surrounding the coil. Different coil designs for a potential endoluminal application are available in the art. The endoluminal RF coils designs exist in multiple forms, including: rigid (GE prostate biopsy guidance coil, (R. D. Watkins, K. W. Rohling, E. E. Uzgiris, C. L. Dumoulin, R. D. Darrow and R. O. Giaquinto, "Magnetic Resonance Image Guided Biopsy in Prostate", page 412, Book of Abstracts, ISMRM 2000), flexible (Atalar, E., P. A. Bottomley, and E. A. Zerhouni, Method of Internal Magnetic Resonance Imaging and Spectroscopic Analysis and Associated Apparatus, Assignee: Johns Hopkins University: U.S. Pat. No. 5,699,801, Dec. 23, 1997), and others. A quadrature/phased array endo-luminal design was also disclosed earlier (Atalar, U.S. Pat. No. 5,699,801).

Brief Summary Text (18):
However, there remains a need for providing high SNR and increased signal homogeneity in endocavitary designs. Mutual inductance between two or more independent but geometrically adjacent coils, tuned to the same resonance frequency may under certain circumstances improve the SNR and signal homogeneity, but such designs can also result in coupling between the coils that might result in poor signal performance and decreased signal penetration depth into the tissue. Usually, this mutual inductance is compensated for by adding combinations of capacitors, inductors, and/or other electronic elements to the resonant circuit of the coils. Another means of compensation is, to mechanically align the two or more coils in a way to each other, so that the coils are geometrically isolated from another.

Brief Summary Text (19):
Geometric decoupling, however, does not always result in sufficient isolation. The overall coil performance might be still degraded due to residual coupling between the coils. However, there has been no simple method of eliminating coupling between elements of these types of designs taught, thereby impeding the clinical uses of such devices. The use of a metallic paddle to steer the magnetic flux of a coil as a means to insulate two or more adjacent coils from each other was published in the literature in 1946 by Bloch, Hansen and Packard (F. Bloch, W. W. Hansen, M. E. Packard, Phys. Rev. 70:474 (1946)) and was then reconsidered by Andrew (E. R. Andrew, Nuclear Magnetic Resonance. Pp.56-63, Cambridge Univ. Press, London, (1955)) and then by Hoult et al. (D. I. Hoult, C. N. Chen, V. J. Sank, Quadrature detection in the laboratory frame. Magn. Reson. Med. 1, 339-353 (1984)). In these publications, however, a rather small paddle was used to decouple large volume coils from one another, to minimize distortions of the B.sub.1 field homogeneity to the inside of the coil. The application of such a paddle to an `inside out` design of endoluminal coils, as first described in this report, enabled the paddle to be inserted into the most sensitive region between the coils. Furthermore, the paddle could be designed larger relative to the size of the coils, providing a very effective means of coil insulation, virtually without affecting the B.sub.1 field

toward the outside of the coil. No additional electronics were required to achieve an isolation of about 50 dB. Signal homogeneity as well as signal penetration depth and therefore image quality was markedly improved by minimizing the mutual inductance between the coils. There remains a need in the art, therefore for a means to minimize the mutual indictance between two or more independent RF transmit or receive coils in MRI or MRS that is simple to implement and effective. There is a further need to device a RF coil for endoluminal applications that can improve signal homogeneity and signal penetration depth.

Brief Summary Text (21):
In one aspect, the present invention provides an apparatus for magnetic resonance imaging of an anatomic region of a human pelvis. In one embodiment, and apparatus according to the present invention may provide an endourethral magnetic resonance imaging coil comprising an antenna, and interface circuit interposed between the antenna and a MRI machine, said interface circuit being in electrical communication with the antenna and being in electrical communication to the MRI machine and comprising a tuning-matching circuit, a decoupling circuit and a balun circuit, and a housing enveloping the antenna. The antenna may be formed on a flexible circuit. The interface circuit may be enclosed within an interface box connected to the antenna by a connector. The antenna may be a receive-only coil. The tuning-matching circuit may comprise at least two sets of capacitors, a first set in series and a second set in parallel. The decoupling circuit may comprise a PIN diode. The interface circuit may further comprise a DC regulating circuit. The housing may be sealed at a distal end. In this embodiment and in all embodiments of the present invention, the electrical communication between the interface circuit and the MRI machine may be made using a wireless connection, and in certain other embodiments of the present invention, the electrical communication between the interface circuit and the antenna may be made using a wireless connection.

Brief Summary Text (22):
In another aspect, the invention provides an apparatus for magnetic resonance imaging (MRI) of an anatomic region of a human pelvis, comprising an endourethral magnetic resonance imaging coil system, comprising a first antenna and a second antenna, wherein said second antenna is oriented at a preselected position with respect to said first antenna; and further comprising an interface system interposed between a MRI machine and said first and second antennas, said interface system being in electrical communication with said MRI machine and with each of said first antenna and said second antenna, said interface system comprising a tuning-matching system, a decoupling system and a balun system; and further comprising a housing enveloping at least one of said first antenna and said second antenna.

Brief Summary Text (23):
In yet another aspect, the present invention provides a system for treating an anatomic region within a pelvis of a patient, comprising an elongate member insertable into a urethra of the patient and temporarily retainable in said urethra, said elongate member housing an endourethral imaging system and an endourethral therapeutic system, wherein said endourethral imaging system comprises an endourethral MRI coil comprising an antenna, and said endourethral therapeutic system comprises an endourethral delivery device to deliver a mode of therapy transurethrally to an area of the anatomic region imaged by the endourethral imaging system; and further comprising an interface circuit interposed between said antenna and a MRI machine, said interface circuit being electrical communication with said antenna and being in electrical communication with the MRI machine, said interface circuit comprising a tuning-matching circuit, a decoupling circuit and a balun circuit.

Brief Summary Text (24):
In one aspect, the present invention may provide methods for treating an anatomic region within a pelvis of a patient. In one practice of the method, steps include

providing a medical device comprising an elongate member insertable into and temporarily retainable within a urethra of the patient, said elongate member housing an endourethral imaging system and an endourethral therapeutic system, wherein said endourethral imaging system comprises an endourethral MRI coil comprising an antenna, and said endourethral therapeutic system comprises an endourethral delivery device to deliver a mode of therapy transurethrally to an area of the anatomic region imaged by the endourethral imaging system; providing an interface circuit interposed between said antenna and a MRI machine, said interface circuit being in electrical communication with said antenna and being in electrical communication with the MRI machine, said interface circuit comprising a tuning-matching circuit, a decoupling circuit and a balun circuit; providing the MRI machine; inserting said elongate member into the urethra of said patient; temporarily retaining said elongate member in said urethra; positioning the pelvis of the patient in a diagnostically effective position relative to the MRI machine; using the MRI machine to excite magnetic resonance signals within tissues surrounding the anatomic region; applying gradient magnetic pulses to said human pelvis to spatially encode the magnetic resonance signals; receiving said magnetic resonance signals in said endourethral MRI coil and producing responsive output signals therefrom; processing said output signals to obtain an image of the anatomic region; identifying an area of the anatomic region to be treated; positioning the endourethral therapeutic system in therapeutic proximity to the area; and delivering transurethrally the mode of therapy to said area using said transurethral delivery device. As used herein, temporarily retaining the elongate member in the urethra refers to any temporary retention, no matter how long or short in duration, which is adequate to accomplish some aspect of the diagnostic or therapeutic procedures of the method. Temporary retention permits the elongate member to be repositioned in a different position during the course of diagnosis or treatment. Positioning the pelvis of the patient in a diagnostically effective position will be understood to practitioners of the MRI art to relate to the proper positioning of the body part to be imaged with respect to the main MRI machine. Positioning the endourethral therapeutic system in therapeutic proximity to the area will be understood by practitioners in the art to refer to any positioning from whence the endourethral therapeutic system may deliver a therapeutically effective amount of the mode of therapy to the area of the anatomic region to be treated.

Brief Summary Text (25):
In another aspect, the present invention may provide methods of evaluating an anatomic region of the human pelvis. In one practice, the method may comprise providing an endourethral MR receiver coil having an antenna disposed upon a flexible circuit, providing an interface circuit in electrical communication with said antenna, said interface circuit comprising a tuning-matching circuit, a decoupling circuit, and a balun circuit, providing a housing enveloping the antenna, providing an MRI machine in electrical communication with the interface circuit, inserting the endourethral MR receiver coil into a human urethra within the human pelvis, situating the human pelvis within a main magnetic field of the MRI machine, imposing the main magnetic field on the human pelvis, applying RF pulses to the human pelvis to excite magnetic resonance signals within the human pelvis, applying gradient magnetic pulses to the human pelvis to spatially encode the magnetic resonance signals received resonance signals in the endo urethral MR receiver coil, emitting responsive output signals from the endourethral MRI receiver coil, processing the output signals and converting them to information about the anatomic region of the human pelvis, thereby to evaluate the anatomic region.

Brief Summary Text (26):
The systems and methods of the present invention may be directed to a male or to a female subject. In one aspect, these systems and methods may be directed towards the diagnosis of an abnormality of the prostate. In another aspect, these systems and methods may be directed towards the diagnosis of an abnormality of the female

pelvic floor. Coils designed for the male or the female urethra may include specific features adaptable to male or female regional anatomy. Two different coil designs for intraurethral positioning may be included as embodiments of the present invention: a) single-loop coil, and b) quadrature coil. A balun circuit may be implemented into the design of both coils to reduce potential RF heating effects and to improve coil performance. An image intensity correction (IIC) algorithm may be used to compensate for the B.sub.1 signal variation of the endoluminal coils across the small field of views (FOV's) being used.

Drawing Description Text (6):
FIG. 4 provides a schematic diagram of a balun assembly.

Drawing Description Text (8):
FIG. 6 provides an electrical schematic of an embodiment of an imaging coil and interface circuit.

Drawing Description Text (9):
FIG. 7 provides a schematic view of an imaging coil embodiment.

Drawing Description Text (10):
FIG. 8 provides a cross-sectional view of the lumen with an imaging coil therein.

Drawing Description Text (11):
FIGS. 9A and B provide longitudinal and transverse cross-sections of an embodiment of an imaging coil system.

Drawing Description Text (12):
FIGS. 10A and B provide schematic electrical diagrams of a single imaging coil and interface circuit and a double imaging coil and interface circuit.

Drawing Description Text (13):
FIGS. 11A and B provide a schematic longitudinal and cross-sectional view of two imaging coils combined with a decoupling paddle.

Drawing Description Text (14):
FIG. 12 provides a schematic electrical diagram of two imaging coils and interface circuits combined with a decoupling paddle.

Drawing Description Text (15):
FIG. 13A-D provide longitudinal and cross-sectional views of folded and expanded decoupling paddles.

Drawing Description Text (16):
FIG. 14 provides a schematic diagram of a remotely manipulable decoupling paddle.

Drawing Description Text (17):
FIGS. 15A and B provide a schematic diagram of an embodiment of an imaging coil adapted for use in a male urethra.

Drawing Description Text (20):
FIG. 18 depicts an endourethral imaging system combined with RF ablation.

Drawing Description Text (21):
FIG. 19 depicts an endourethral imaging system combined with laser ablation.

Detailed Description Text (9):
Evaluation of the urethra in female and male patients presents challenging clinical and radiological problems. The ability to image the urethra in higher resolution than currently clinically available may permit more satisfactory investigation of incontinence and other urethral abnormalities. Contributing to the investigation of

? d s
Set Items Description
S1 4521 S AU=(GROSS P? OR GROSS, P?)
S2 2011429 S MRI OR MAGNETIC(1W)(IMAG? OR IMAGING) OR MAGNETIC(W)RESONAN? OR NMR OR NUCLEAR()MAGNETIC()RESONANCE OR FTNMR OR FTMRI
S3 185712 S MAGNETORESONANCE OR PMR OR PROTON(W)MAGNETIC(W)RESONAN? OR MR()(IMAGE? OR IMAGING)
S4 8264 S MC=(S01-E02A2 OR S03-E07A OR S01-E02A8A OR S01-E02A1 OR S03-E07C OR S05-D02B1 OR S03-C02F1)
S5 50970 S IC=(G01N-024/08 OR G01V-003/A75 OR G01R-033/56F OR G01V-003/00)
S6 24414 S CC=(A0758 OR A8760I OR B7510N)
S7 2085973 S S2:S5
S8 561415 S RADIO()FREQUENC? OR RF? ?
S9 642497 S ANTENNA? ?
S10 5989 S DECOUPL?(2N)(CIRCUIT? OR MODE? ?)
S11 44298 S END(2N)TERMINAL?
S12 12130 S BIAS(2N)POTENTIAL?
S13 5006136 S SWITCH? OR ALTERNAT? OR TOGGLE?
S14 37091 S S8 AND S9
S15 15 S S14 AND S10
S16 4 S S15 AND (S6 OR S7)
S17 4 RD (unique items)
S18 1 S S17 AND S1
S19 3 S S17 NOT S18
S20 140 S S8 AND S10
S21 0 S S20 AND S9 AND S12
S22 15 S S20 AND (S9 OR S12)
S23 14 RD (unique items)
S24 10 S S23 NOT S17
S25 1 S S10 AND S1
S26 2087727 S S6 OR S7
S27 154 S S26 AND S10
S28 51 S S27 AND (S8 OR S9 OR S11 OR S12)
S29 45 RD (unique items)
S30 41 S S29 NOT (S25 OR S24 OR S17)
S31 173 S S10(6N)S13
S32 2 S S8 AND S31
S33 2 RD (unique items)

? show files

[File 155] **MEDLINE(R)** 1951-2006/May 23

[File 2] **INSPEC** 1898-2006/May W1

[File 5] **Biosis Previews(R)** 1969-2006/May W2

[File 6] **NTIS** 1964-2006/May W1

[File 8] **Ei Compendex(R)** 1970-2006/May W1

[File 305] **Analytical Abstracts** 1980-2006/May W1

**File 305: Alert feature enhanced for multiple files, duplicate removal, customized scheduling. See HELP ALERT.*

[File 350] **Derwent WPIX** 1963-2006/UD,UM &UP=200632

**File 350: Preview the enhanced DWPI through ONTAP DWPI (File 280). For more information, visit http://www.dialog.com/dwpi/.*

[File 162] **Global Health** 1983-2006/Apr

[File 164] **Allied & Complementary Medicine** 1984-2006/May

[File 357] **Derwent Biotech Res.** _1982-2006/May W2

[File 315] **ChemEng & Biotec Abs** 1970-2006/Apr

[File 23] **CSA Technology Research Database** 1963-2006/May

[File 46] **Corrosion Abstracts** 1966-2006/May

[File 68] **Solid State & Superconductivity Abstracts** 1966-2006/May

[File 60] **ANTE: Abstracts in New Tech & Engineer** 1966-2006/May

[File 33] **Aluminium Industry Abstracts** 1966-2006/May

[File 335] **Ceramic Abstracts/World Ceramics Abstracts** 1966-2006/May

[File 294] **ONTAP(R) SciSearch(R) Cited Ref Science**